SLV-E850B/E850UX/E880EG/F900B/F900NP/F900UX/ F900VC/F990B/F990NP/F990UX/F990VC

RMT-V222C/V222D/V222E/V223C/V240/V240A/V240B/V240C/V240D

SERVICE MANUAL

French Model
SLV-E850B/F900B/F990B

UK Model
SLV-E850UX/F900UX/F990UX

Greek Model
SLV-E880EG

Spanish Model
SLV-F900NP/F990NP

Germany Model
SLV-F900VC/F990VC

Hi-Fi

VHS

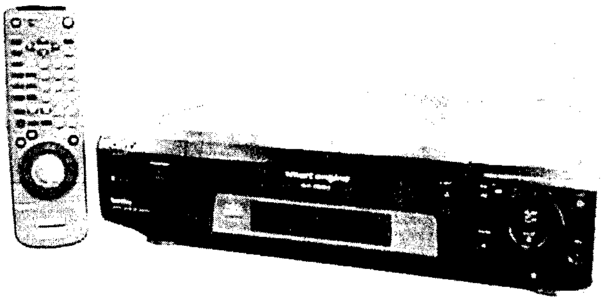

Photo : SLV-F990

- **Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENTS VI for MECHANICAL ADJUSTMENTS. (9-921-647-11)**

S MECHANISM

SPECIFICATIONS

System

Channel coverage
PAL (D/K, B/G)
VHF E2 to E12, R1-R12
UHF E21 to E69, R21-R69
CATV S01 to S05, S1 to S41
RF output signal
UHF channels 21 to 69
Aerial out
75-ohm asymmetrical aerial socket

Inputs and outputs

⊖ LINE-1 (TV)
21-pin
Video input: pin 20
Audio input: pins 2 and 6
Video output: pin 19
Audio output: pins 1 and 3

⊖ LINE-3 IN
21-pin
Video input: pin 20
Audio input: pins 2 and 6
LINE-2 IN
VIDEO IN, phono jack (1)
Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO IN, phono jack (2)
Input level: 327 mVrms
Input impedance: more than 47 kilohms
LINE-2 OUT
VIDEO OUT, phono jack (1)
Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO OUT, phono jack (2)
Rated output level: 327 mVrms
Load impedance: 47 kilohms
Output impedance: less than 10 kilohms

General

Power requirements
220 – 240 V AC, 50 Hz
Power consumption
23 W
Operating temperature
5°C to 40°C
Storage temperature
–20°C to 60°C
Dimensions
Approx. 430 × 100 × 314 mm (w/h/d) including projecting parts and controls
Mass
Approx. 4.6 kg

Supplied accessories

Remote commander (1)
R6 (size AA) batteries (2)
Aerial cable (1)
Audio cable (1)
EURO-AV cable (1)

Design and specifications are subject to change without notice.

VIDEO CASSETTE RECORDER

SONY®

OFILM

FEATURE DIFFERENCE

MODEL NAME	E850UX	E850B	E880EG	F900VC	F900NP	F900B	F900UX	F990VC	F990NP	F990B	F990UX
SAFETY SECAM (REC/PB)		O/O				O/O				O/O	
ME-SECAM (REC/PB)		X/O	O/O			X/O				X/O	
FLAP (W/SW)				O	O	O	O	O	O	O	O
COMMAND SW								O	O	O	O
DNR			O	O	O		O	O	O	X	O
ML KEY				O(4)	O(4)	O(4)	O(4)	O(4)	O(4)	O(4)	O(4)
COUNTER RESET			O					O	O	O	O
AUDIO OUT 2	RCA	RCA		RCA	RCA	RCA	RCA				
EUR IN (2nd)	in	C+/in	C+/in	C+/in	C+/in	C+/in	in	C+/in	C+/in	C+/in	in
ADDITIONAL IN (RCA INPUT)								O	O	O	O
LINE 2 OUT			O					O	O	O	O
SAT CONTROL	O	O	△					O	△	O	O
ACS (△ : ACA)	O	O	△	△	O	O	O	△	O	O	O
TUNER BTF-	WU601	3WC443	3WC425	3WC402	WC411	3WC443	WU601	3WC402	WC411	3WC443	WU601
SYSTEM 1	I	L	DK	BG	BG	L	I	BG	BG	L	I
STEREO	NI	NI	ZWEI	ZWEI	N/Z	NI	NI	ZWEI	N/Z	NI	NI
SYSTEM 2		BG	BG			BG				BG	
STEREO		ZWEI	ZWEI			ZWEI				ZWEI	
CATV		O	O	O	O	O		O	O	O	
RF OUT SYS	I	L/G	K/G	G	G	L/G	I	G	G	L/G	I
REMOTE COMMANDER	V240	V240A	V223C	V222C	V222C	V222E	V222D	V240B	V240B	V240D	V240C
VTR MODE	3	3	3	3	3	3	3	1.2.3	1.2.3	1.2.3	1.2.3
LANGUAGE	ENG	FRE	ENG	ENG	ENG	FRE	ENG	ENG	ENG	FRE	ENG
SLOW				O	O	O	O				
SHOW VIEW/VIDEO PLUS	V PLUS DX	SVDX	SV	SV	SV	SV	V PLUS	SV DX	SV DX	SV DX	V PLUS DX
AUDIO DUB	O	O	O					O	O	O	O
REPLAY	O	O	O					O	O	O	O
X2	O (RING)	O (RING)	O	O	O	O	O	O (RING)	O (RING)	O (RING)	O (RING)
FRAME	O (RING)	O (RING)	O (JOY)	O	O	O	O	O (RING)	O (RING)	O (RING)	O (RING)
TITLE				O	O	O	O	O	O	O	O
SAT	O	O						O	O	O	O

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈSES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPÉMENTS PUBLIÉS PAR SONY.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replace-ment.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit Board Repairing
   - Keep the temperature of the soldering iron around 270°C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

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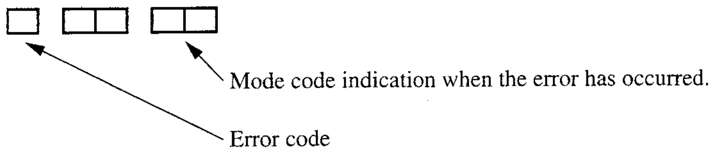
1. ERROR CODE INDICATION

- Error codes are indicated using the lower 5 digits in the fluorescent display tube.
  "At this time, Colon ":" between character is not indicated."



ERROR CODE

0	No error
1	Cam encoder error Loading direction
2	Cam encoder error Unloading direction
3	T reel error
4	S reel error
5	Capstan error
6	Drum error
7	Error on initializing
8	Cassette loading error
9	Reserve

MODE CODE

0	Power-on eject	10	FWD x1	20	REW play
1	Power-on initial	11	FWD x2	21	Cas. loading
2	Power-off eject	12	CUE	22	Tape loading
3	Power-off stop	13	PB-pause	23	Power-off loading
4	FF	14	RVS-pause	24	Mecha. error (Power on)
5	REW	15	RVS x1	25	Power-on eject initial
6	REC	16	RVS x2	26	Power-off eject initial
7	REC- pause	17	REV	27	APC REC
8	Power-on stop	18	Power-off initial	28	Cas. loading (No auto PB check)
9	PB	19	Mecha. error (Power off)		

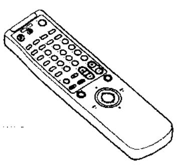
SECTION 1
GENERAL

This section is extracted from SLV-E880EG instruction manual.

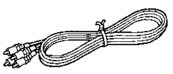
Step 1
Unpacking

Check that you have received the following items with the VCR:

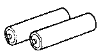
- Remote commander



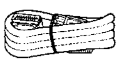
- Audio cable



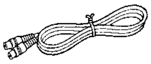
- R6 (size AA) batteries



- EURO-AV cable

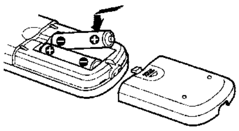


- Aerial cable



Step 2
Setting up the remote commander

Inserting the batteries

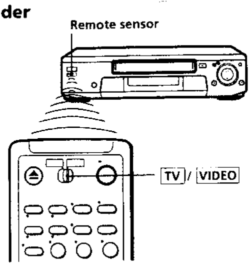


Insert two R6 (size AA) batteries by matching the + and – on the batteries to the diagram inside the battery compartment.

Insert the negative (-) end first, then push in and down until the positive (+) end clicks into position.

Using the remote commander

You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your Sony TV. If the TV does not have the ■ symbol near the remote sensor, this remote commander will not operate the TV.



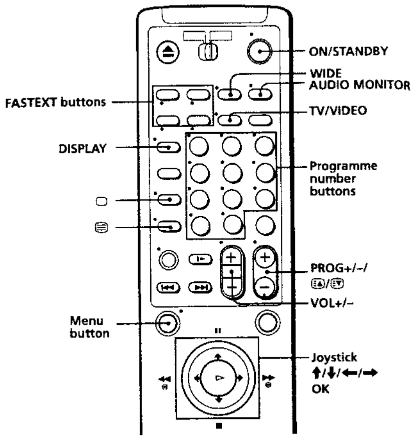
To operate	Set TV / VIDEO to
the VCR	VIDEO and point at the remote sensor on the VCR
a Sony TV	TV and point at the remote sensor on the TV

Using the joystick

Mode	Operation	Action
Normal	Push up/down/left/right ↑/↓/←/→ Press	PAUSE/STOP/FF/REW PLAY
Menu	Push up/down/left/right ↑/↓/←/→ Press	Select in menu OK

continued

Step 2 : Setting up the remote commander (continued)



TV control buttons

To	Press
Turn the TV into standby or active mode	ON/STANDBY
Select an input source of the TV either from aerial in or from line in	TV/VIDEO
Select the programme position of the TV	Programme number buttons PROG +/–
Adjust the volume of the TV	VOL +/–
Switch to TV (Teletext off)	☐ (TV)
Switch to Teletext	⊜ (Teletext)

To	Press
Select the sound	AUDIO MONITOR
Use FASTEXT	FASTEXT buttons
Call up on-screen display	DISPLAY
Change the Teletext page	▲/▼
Operate TV menu options	MENU Joystick (↑/↓/←/→ , OK)
Switch the wide mode of a Sony wide TV (For other manufacture's wide TV, see "Controlling other TVs with the remote commander" below.)	WIDE

Notes
- In normal use, the batteries should last about three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries together.
- Some buttons may not work with certain Sony TVs.

Controlling other TVs with the remote commander

The remote commander is preprogrammed to control non-Sony TVs. If your TV is listed in the table below, set the appropriate manufacturer's code number.

1. Set TV/VIDEO at the top of the remote commander to TV.
2. Hold down ON/STANDBY, and enter your TV's code number(s) using the programme number buttons. Then release ON/STANDBY.
   Now you can use the following TV control buttons to control your TV: ON/STANDBY, TV/VIDEO, programme number buttons, PROG +/–, VOL +/–, ☐ (TV), ⊜ (Teletext), FASTEXT buttons, and WIDE with some TV.

Tip
- If you set your TV's code number correctly while the TV is turned on, the TV turns off automatically.

continued

Code numbers of controllable TVs

If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

To make wide mode settings, see the footnotes below this table for the applicable code numbers.

Manufacturer	Code number	Manufacturer	Code number
Sony	01[*1], 02	Philips	06[*1], 07[*1], 08[*1]
Akai	68	Saba	12, 13
Ferguson	52	Samsung	22, 23
Grundig	10[*1], 11[*1]	Sanyo	25
Hitachi	24	Sharp	29
Mitsubishi	27[*1], 28[*1], 50[*1], 51[*1]	TEAC	67
NEC	66	Telefunken	36
Nokia	15, 16, 69[*3]	Thomson	43[*2]
Panasonic	17[*1], 49	Toshiba	38

[*1] Press WIDE to switch the wide picture mode on or off.

[*2] Press WIDE, then press VOL +/– to select the wide picture mode you want.

[*3] Press WIDE. The menu appears on the TV screen. Then, push joystick to ↑/↓/←/→ to select the wide picture you want and press joystick (OK).

Notes

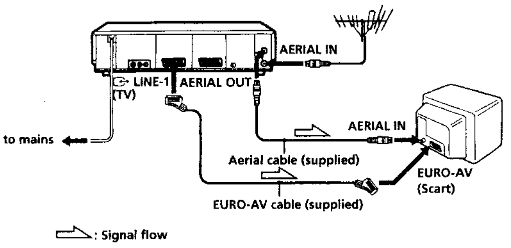
- If the TV uses a different remote control system from the one programmed to work with the VCR, you cannot control your TV with the remote commander.
- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote commander, the code number automatically resets to 01 (Sony). Reset the appropriate code number.

Step 3

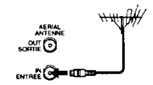
Connecting the VCR

If your TV does not have a EURO-AV connector, see page 12.

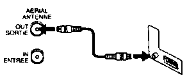
If your TV has a EURO-AV (Scart) connector



1 Disconnect the aerial cable from your TV and connect it to AERIAL IN on the rear panel of the VCR.



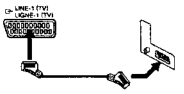
2 Connect AERIAL OUT of the VCR and the aerial input of your TV using the supplied aerial cable.



continued

3 Connect LINE-1 (TV) on the VCR and the EURO-AV (Scart) connector on the TV with the supplied EURO-AV cable.

This connection improves picture and sound quality. If your TV doesn't have a EURO-AV (Scart) connector, see page 12.



4 Connect the mains lead to the mains.

Note

- If the TV is connected to the LINE-1 (TV) connector, setting the RF MODULATOR in the OTHER OPTIONS menu to OFF is recommended (initial setting). In the OFF position, only the signal from the aerial is output through the AERIAL OUT connector (see page 68). You do not have to tune your TV to the VCR . Skip "Tuning your TV to the VCR" on page 14.

About the SMARTLINK features

If the connected TV complies with SMARTLINK, NexTView Link, MEGALOGIC[*1] or EASYLINK[*2], you can use the SMARTLINK function after you complete the steps on the previous page (the SMARTLINK indicator appears in the VCR's display window when you turn on the TV). You can enjoy the following SMARTLINK features.

- Preset Download

  You can download your TV tuner preset data to this VCR and tune the VCR according to that data in Auto Set Up. This greatly simplifies the Auto Set Up procedure. Be careful not to disconnect the cables nor to exit the function during procedure.

  See "Setting up the VCR with Auto Set Up" on page 16.
- TV Direct Rec
  You can easily record what you are watching on the TV (other than tapes being played on this VCR). For details, see "Recording what you are watching on the TV (TV Direct Rec)" on page 47.
- One Touch Play
  With One Touch Play, you can start playback automatically without turning on the TV. For details, see "Starting playback automatically with one button (One Touch Play)" on page 43.
- One Touch Menu
  You can turn on the VCR and TV, set the TV to the video channel, and display the VCR's on-screen display automatically by pressing MENU on the remote commander.
- One Touch ShowView
  You can turn on the VCR and TV, set the TV to the video channel, and display the ShowView menu automatically by pressing ShowView on the remote commander.
- Automatic Power Off
  You can have the VCR turn off automatically, if the VCR is not used for about 1 minute, after you turn off the TV.
- NexTView Download
  You can easily set the timer recording by using the NexTView Download function of your TV. Please, refer to your TV's instruction manual.

[*1] "MEGALOGIC" is a registered trademark of Grundig Corporation.

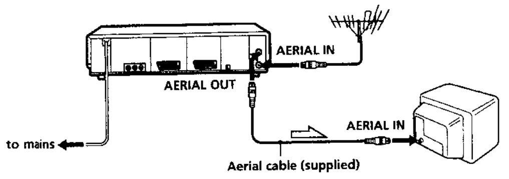
[*2] "EASYLINK" is a trademark of Philips Corporation.

Note

- Not all the TVs respond to the functions above.

continued

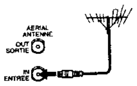
If your TV doesn't have a EURO-AV (Scart) connector



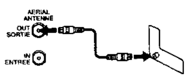
Aerial cable (supplied)

⇨ : Signal flow

1 Disconnect the aerial cable from your TV and connect it to AERIAL IN on the rear panel of the VCR.



2 Connect AERIAL OUT of the VCR and the aerial input of your TV using the supplied aerial cable.



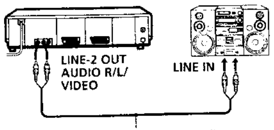
3 Connect the mains lead to the mains.

You now have to tune your TV to your VCR (see page 14).

Additional connection

To a stereo system

You can improve sound quality by connecting a stereo system to the LINE-2 OUT AUDIO R/L/VIDEO jacks as shown on the right.

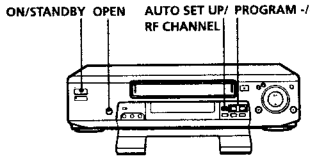


Audio cable (supplied)

Step 4

Tuning your TV to the VCR

If you have connected the VCR to your TV using the EURO-AV cable, skip this step.



1 ON/STANDBY — Press ON/STANDBY to turn on the VCR.

OPEN — Press OPEN to open the drop down panel.

2 AUTO SET UP / RF CHANNEL — Press briefly AUTO SET UP/RF CHANNEL on the VCR.

The factory-preset RF channel appears in the display window.

The VCR signal is output through this channel to the TV.

RF 32

3 Turn on your TV and select a programme position for the VCR picture.

This channel will now be referred to as the video channel.

4 AUTO SET UP / RF CHANNEL — Press AUTO SET UP/RF CHANNEL

The TV system appears in the display window.

RF 32 K

---

5 PROGRAM - + — Press PROGRAM -/+ (repeatedly) to select the correct TV system. If you watch the system B/G, select "G". If you watch the system D/K, select "K".

RF 32 G

6 Tune the TV to the same channel as the one shown in the display window so that the picture on the right appears clearly on the TV screen.

SONY VIDEO CASSETTE RECORDER

Refer to your TV manual for tuning instructions.

If the picture does not appear clearly, see "To obtain a clear picture from the VCR" below.

7 AUTO SET UP / RF CHANNEL — Press AUTO SET UP/RF CHANNEL.

You have now tuned your TV to the VCR. From now on, whenever you want to play a tape, set the TV to the video channel.

To check if the TV tuning is correct

Set the TV to the video channel and press PROGRAM -/+ on the VCR. If the TV screen changes to a different programme each time you press PROGRAM -/+, the TV tuning is correct.

To obtain a clear picture from the VCR

If the picture does not appear clearly in step 6 above, go to step 7 to finish this procedure once. Then start from step 2. After pressing AUTO SET UP/ RF CHANNEL in step 2 to display the RF channel, press PROGRAM -/+ so that another RF channel appears. Then tune the TV to the new RF channel until a clear picture appears.

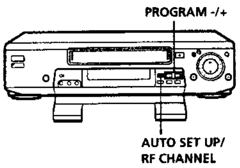
Notes

- When you connect the VCR and your TV only with an aerial cable, you have to set RF MODULATOR in the OTHER OPTIONS menu to ON (see page 68).
- If you set the wrong TV system, you may have no sound or may be distorted.

Step 5

Setting up the VCR with the Auto Set Up function

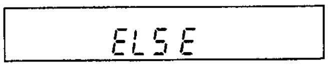
Before using the VCR for the first time, set up the VCR using the Auto Set Up function. With this function, you can set the language for the on-screen display, TV channels, and the VCR clock.


PROGRAM -/+
AUTO SET UP/
RF CHANNEL

1 AUTO SET UP / RF CHANNEL

Press AUTO SET UP/RF CHANNEL on the VCR for more than 3 seconds.

The VCR automatically turns on, and the country abbreviation appears in the display window.



---

2 PROGRAM - +

Press PROGRAM -/+ to highlight the abbreviation of your country.
For some countries, there is a selection of languages to choose from.

The abbreviations of the countries are as follows:

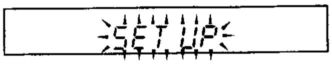
Abbreviation	Country	Language
CZ	Czech	Czech
GR	Greece	Greek
HUN	Hungary	Hungarian
PL	Poland	Polish
RUS	Russia	Russian
ELSE	Other countries	English

If your country does not appear, select ELSE.

3 AUTO SET UP / RF CHANNEL

Press AUTO SET UP/RF CHANNEL.

The auto preset function starts searching for all of the receivable channels and presets them in numerical order.



When no more receivable channels can be found, presetting stops and SET UP disappears from the display window.

To cancel the Auto Set Up function
Press AUTO SET UP/RF CHANNEL.

Notes
- If you use the SMARTLINK connection, the SMARTLINK indicator flashes in the display window during Preset Download operation. Do not exit Auto Set Up during the step 3. If you do, repeat Auto Set Up from the beginning.
- Whenever you operate the Auto Set Up function, some of the settings (ShowView, timer etc..) will be reset. In this case, you have to set them again.

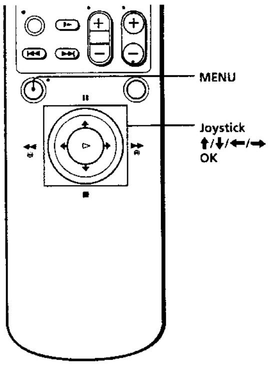
Step 6

Setting the clock

You must set the time and date on the VCR to be able to use the timer recording features properly.

The Auto Clock Set function works only if a station in your area is broadcasting a time signal. If the Auto Set up function did not set the clock correctly for your local area, try another station for the Auto Clock Set function.

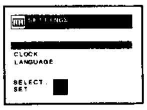
Before you start...
- turn on the VCR and the TV
- set the TV to the video channel..

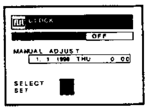

MENU
Joystick
↑/↓/←/→
OK

Setting the clock manually

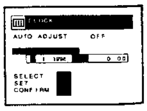
1 MENU

Press MENU, then push the joystick to ↑/↓ to highlight SETTINGS and press the joystick (OK). Push the joystick to ↑/↓ to highlight CLOCK and press the joystick (OK).


CLOCK
LANGUAGE
SELECT
SET

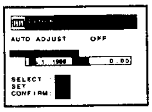

OFF
MANUAL ADJUST
1. 1 1996 THU 0 00
SELECT
SET

2 Push the joystick to ↑/↓ to highlight MANUAL ADJUST then press the joystick (OK).

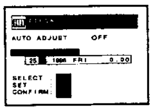

AUTO ADJUST OFF
1 1996 0 00
SELECT
SET
CONFIRM

---

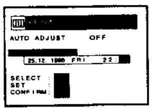
3 Push the joystick to ↑/↓ to set the date.
The day of the week is set automatically.


AUTO ADJUST OFF
1. 1996 0 . 00
SELECT
SET
CONFIRM

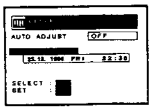
4 Push the joystick to → to highlight the month and set the month using the joystick ↑/↓.


AUTO ADJUST OFF
25. 1996 FRI 0 . 00
SELECT
SET
CONFIRM

5 Set the year, hour, and minutes in sequence, using the joystick → to highlight the item to be set, and the joystick ↑/↓ to select the digits.


AUTO ADJUST OFF
25.12. 1996 FRI 22 :
SELECT
SET
CONFIRM

6 Press the joystick (OK) to confirm the setting and start the clock.


AUTO ADJUST OFF
25.12. 1996 FRI 22 : 30
SELECT
SET

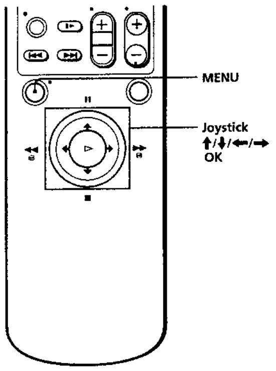
7 MENU

Press MENU to exit the menu.

continued

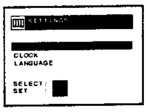
Step 6 : Setting the clock (continued)

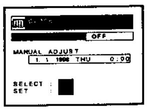
Changing the station for Auto Clock Set



1 Press MENU, then push the joystick to ↑/↓ to highlight SETTINGS and press the joystick (OK). Push the joystick to ↑/↓ to highlight CLOCK and press the joystick (OK).

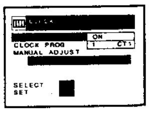
When using the Auto Set Up procedure, skip this step.


CLOCK
LANGUAGE
SELECT :
SET :


OFF
MANUAL ADJUST
1. 1. 1996 THU 0:00
SELECT :
SET :

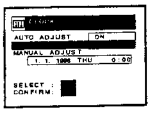
2 Press OK to enter pop up menu and push the joystick to ↑/↓ to set AUTO ADJUST to ON.

Press the joystick (OK).


ON
CLOCK PROG 1 CT1
MANUAL ADJUST
SELECT
SET

3 Push the joystick to ↓ to highlight CLOCK PROG, then press the joystick (OK). Push the joystick to ↑/↓ repeatedly until the programme position of the station that carries the time signal appears.

If the VCR does not receive the time signal from any station, AUTO ADJUST returns to OFF automatically.


AUTO ADJUST ON
MANUAL ADJUST
1. 1. 1996 THU 0:00
SELECT :
CONFIRM :

4 Press MENU to exit the menu.

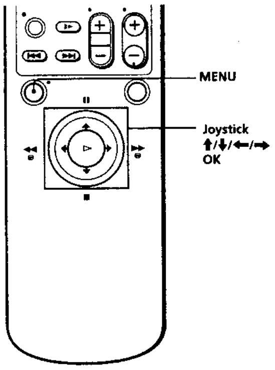
Tips

- To change the digits during setting, push the joystick to ← to return to the item to be changed, and select the digits using the joystick ↑/↓.
- If you set AUTO ADJUST to ON, the Auto Clock Set is activated whenever the VCR is turned off. The date and time is adjusted automatically by making reference to the time signal from the station whose programme position is displayed in the "CLOCK PROG" row.
  If you do not need the Auto Clock Set, set AUTO ADJUST to OFF.

Note

- The menu disappears automatically if you don't proceed for more than a few minutes.

Manual setup — Selecting a language

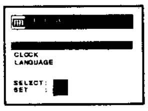


You can change the on-screen display language from the one you selected with the Auto Set Up function.

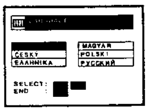
Before you start...

- turn on the VCR and the TV
- set the TV to the video channel.

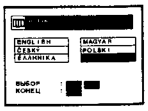
1 Press MENU, then push the joystick to ↑/↓ to highlight SETTINGS and press the joystick (OK).


CLOCK
LANGUAGE
SELECT :
SET :

2 Push the joystick to ↑/↓ to highlight LANGUAGE, then press the joystick (OK).

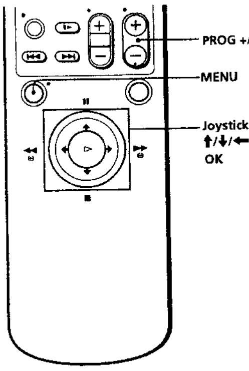

ČESKÝ
ΕΛΛΗΝΙΚΑ
MAGYAR
POLSKI
РУССКИЙ
SELECT :
END :

3 Push the joystick to ↑/↓/←/→ to highlight the desired language, then press the joystick (OK).


ENGLISH
ČESKÝ
ΕΛΛΗΝΙΚΑ
MAGYAR
POLSKI
ВЫБОР :
КОНЕЦ :

4 Press MENU to exit the menu.

Manual setup — Presetting channels

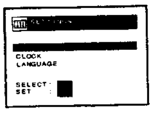


If some channels could not be preset using the Auto Set Up function, you can preset them manually.

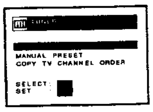
Before you start...

- turn on the VCR and the TV
- set the TV to the video channel.

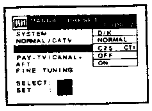
1 Press MENU, then push the joystick to ↑/↓ to highlight SETTINGS and press the joystick (OK).


CLOCK
LANGUAGE
SELECT :
SET :

2 Push the joystick to ↑/↓ to highlight TUNER and press the joystick (OK).

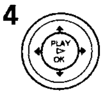

MANUAL PRESET
COPY TV CHANNEL ORDER
SELECT :
SET :

3 Push the joystick to ↑/↓ to highlight MANUAL PRESET and press the joystick (OK).


SYSTEM D/K
NORMAL/CATV NORMAL
C25 CT1
PAY-TV/CANAL+ OFF
AFT ON
FINE TUNING
SELECT :
SET :

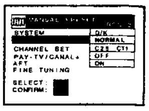
continued

4

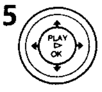


Push the joystick to ↑/↓ to highlight NORMAL/CATV. Press the joystick (OK). Push the joystick to ↑/↓ to select NORMAL then press the joystick (OK).

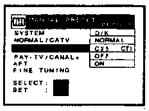
To preset CATV channels, select CATV.


SYSTEM
D/K
NORMAL
CHANNEL SET
C25 CT1
PAY-TV/CANAL+
OFF
AFT
ON
FINE TUNING
SELECT :
CONFIRM :

5



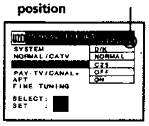
Push the joystick to ↑/↓ to highlight CHANNEL SET.


SYSTEM
D/K
NORMAL/CATV
NORMAL
C25 CT1
PAY-TV/CANAL+
OFF
AFT
ON
FINE TUNING
SELECT :
SET :

6

Press PROG +/– to select the programme position.

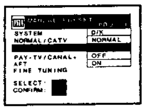
Selected programme position


SYSTEM
D/K
NORMAL/CATV
NORMAL
C25
PAY-TV/CANAL+
OFF
AFT
ON
FINE TUNING
SELECT :
SET :

7

Press the joystick (OK) to highlight the channel number row , then push the joystick to ↑/↓ to start tuning.

The VCR starts searching for a channel and displays the first one it finds on the TV screen. Push the joystick to ↑/↓ repeatedly until the channel you want is displayed. The channels are scanned in the following order.

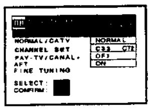

SYSTEM
D/K
NORMAL/CATV
NORMAL
PAY-TV/CANAL+
OFF
AFT
ON
FINE TUNING
SELECT :
CONFIRM :

B/G TV system		**D/K TV system**	
Channel number in the CHANNEL SET field	**Channel**	**Channel number in the CHANNEL SET field**	**Channel**
2	E2	2	R1
3	E3	5	R6
4	E4	6	R7
5	E5	12	R12
6	E6	13	R2
7	E7	14	R3
8	E8	15	R4
9	E9	16	R5
10	E10	17	R8
11	E11	18	R9
12	E12	19	R10
21–69	E21–E69	20	R11
CATV 1–41	S1–S41	21–69	R21–R69
CATV 42–46	S01–S05		

If you know the number of the channel you want, press the programme number buttons. For example, for channel 05, first press "0" and then press "5".

8

If the TV sound is distorted or noisy, push the joystick to ↑/↓ /←/→ to highlight SYSTEM, then select B/G or D/K so that you get the better sound


NORMAL/CATV
NORMAL
CHANNEL SET
C33 CT2
PAY-TV/CANAL+
OFF
AFT
ON
FINE TUNING
SELECT :
CONFIRM :

9

Press the joystick (OK).

continued

---

10 To allocate another channel to another programme position, repeat steps 4 to 8.

11

Press MENU to exit the menu.

Disabling unwanted programme positions

After tuning the TV channels, you can disable unused programme positions. The disabled positions will be skipped later when you press the PROG +/– buttons. You can also disable unwanted programme positions using the CHANNEL LIST menu (page 31).

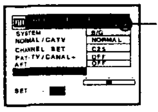
1. In step 7 above, press programme number button "0" twice to display the number "00" beside CHANNEL SET.
2. Press the joystick (OK) to confirm the setting, then press MENU to exit the menu.

If the picture is not clear

Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture is not clear, you may also use the manual tuning function.

1. Press PROG +/– to select the programme number for which you cannot obtain a clear picture.
2. Press MENU, then select SETTINGS and press the joystick (OK).
3. Select TUNER and press the joystick (OK).
4. Select MANUAL PRESET and press the joystick (OK).
5. Select FINE TUNING.

   The fine tuning meter appears.


SYSTEM
B/G
NORMAL/CATV
NORMAL
CHANNEL SET
C25
PAY-TV/CANAL+
OFF
AFT
OFF
SET :

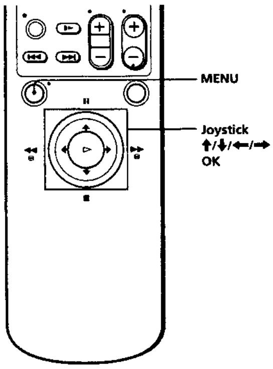
Selected programme position

6. Push the joystick to ←/→ to get a clearer picture. Press MENU to exit the menu.

   Note that the AFT (Auto Fine Tuning) setting switches to OFF.

Note
- The menu disappears automatically if you don't proceed for more than a few minutes.

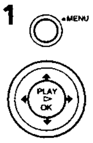
Manual setup — Setting station names


MENU
Joystick
↑/↓/←/→
OK

You can also set station names as you like. The set station names are displayed on the TV screen when you change the programme position on the VCR.

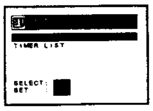
Before you start...
- turn on the VCR and the TV
- set the TV to the video channel.

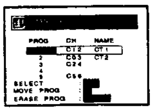
1


•MENU
PLAY
OK

Press MENU, then push the joystick to ↑/↓ to highlight LISTS then press the joystick (OK). Push the joystick to ↑/↓ to highlight CHANNEL LIST and press the joystick (OK).

The preset channels are displayed on the screen. The station names also appear if the VCR detected them in Auto Set Up.

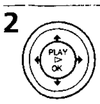

TIMER LIST
SELECT :
SET :


PROG
CH
NAME
C12
CT1
2
C03
CT2
3
C24
4
5
C56
SELECT
MOVE PROG
ERASE PROG

continued

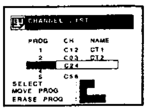
Manual setup — Setting station names (continued)

2

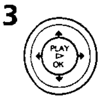


Push the joystick to ↑/↓ to highlight the row on which you want to set the station name.

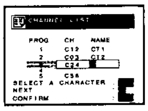
To display other pages for programme positions 6 to 60, push the joystick to ↑/↓ repeatedly.


CHANNEL LIST
PROG CH NAME
1 C12 CT1
2 C03 CT2
C24
4
5 C56
SELECT
MOVE PROG
ERASE PROG

3



- If you want to set the station name, push the joystick to ➡ twice to highlight the station name column only.
- If you don't want to set the station name, go to step 6.


CHANNEL LIST
PROG CH NAME
1 C12 CT1
2 C03 CT2
C24
4
5 C56
SELECT A CHARACTER
NEXT
CONFIRM

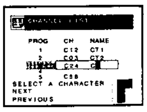
4

Push the joystick to ↑/↓ to select a character.

To set the next character, push the joystick to ➡ to highlight the next space.

If you make a mistake, push the joystick to ⬅ to highlight the character you want to correct, then reset it.

You can set up to five characters for the station name.

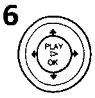

CHANNEL LIST
PROG CH NAME
1 C12 CT1
2 C03 CT2
C24 C
4
5 C56
SELECT A CHARACTER
NEXT
PREVIOUS

5

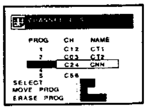
To set the station name of another station, repeat steps 2 to 4.

If you want to change the programme positions of the stations, proceed to step 2 of "Manual setup — Changing/disabling programme positions" on page 29.

6



Press the joystick (OK) to confirm the setting.


CHANNEL LIST
PROG CH NAME
1 C12 CT1
2 C03 CT2
C24 CNN
4
5 C56
SELECT
MOVE PROG
ERASE PROG

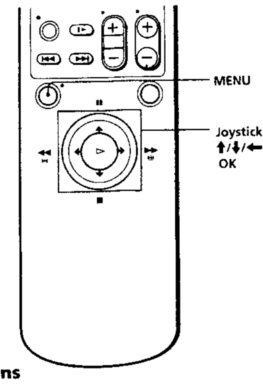
7

Press MENU to exit the menu.

Note

- The menu disappears automatically if you don't proceed for more than a few minutes.

Manual setup — Changing/ disabling programme positions


MENU
Joystick
↑/↓/⬅/➡
OK

After setting the channels, you can change the programme positions as you like. If any programme positions are unused or contain unwanted channels, you can disable them.

Before you start...

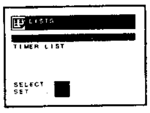
- turn on the VCR and the TV
- set the TV to the video channel.

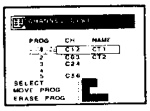
Changing programme positions

e.g. Moving the programme position from 3 to 1.

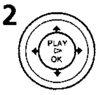
1

Press MENU, then push the joystick to ↑/↓ to highlight LISTS and press the joystick (OK). Push the joystick to ↑/↓ to highlight CHANNEL LIST and press the joystick (OK).


LISTS
TIMER LIST
SELECT
SET

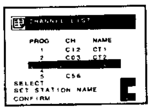

CHANNEL LIST
PROG CH NAME
1 C12 CT1
2 C03 CT2
3 C24
4
5 C56
SELECT
MOVE PROG
ERASE PROG

2



Push the joystick to ↑/↓ to highlight the row on which you want to change the programme position, then push the joystick to ➡.

To display other pages for programme positions 6 to 60, push the joystick to ↑/↓ repeatedly.


CHANNEL LIST
PROG CH NAME
1 C12 CT1
2 C03 CT2
4
5 C56
SELECT
SET STATION NAME
CONFIRM

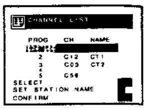
continued

Manual setup — Changing/disabling programme positions (continued)

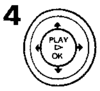
3

Push the joystick to ↑/↓ until the selected channel row moves to the desired programme position.

The selected channel is inserted at the new programme position and the intermediate channels are displaced to fill the gap.


CHANNEL LIST
PROG CH NAME
2 C12 CT1
3 C03 CT2
4
5 C56
SELECT
SET STATION NAME
CONFIRM

4



Press the joystick (OK) to confirm the setting.

5

To change the programme position of another station, repeat steps 2 to 4.

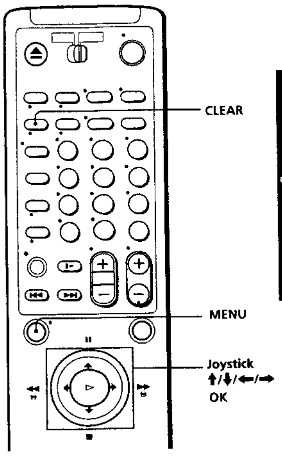
6

Press MENU to exit the menu.

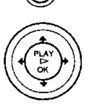
Disabling unwanted programme positions

Note

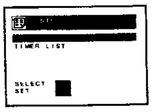
- Be sure to select the programme position you want to disable correctly. If you disable a programme position by mistake, you need to reset that channel manually.

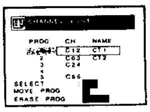

CLEAR
MENU
Joystick
↑/↓/⬅/➡
OK

1

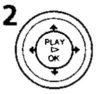


Press MENU, then push the joystick to ↑/↓ to highlight LISTS and press joystick (OK). Push the joystick to ↑/↓ to highlight CHANNEL LIST and press the joystick (OK).

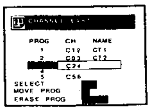

TIMER LIST
SELECT
SET


CHANNEL LIST
PROG CH NAME
C12 CT1
2 C03 CT2
3 C24
4
5 C56
SELECT
MOVE PROG
ERASE PROG

2



Push the joystick to ↑/↓ to highlight the row which you want to disable.

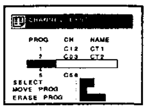

CHANNEL LIST
PROG CH NAME
1 C12 CT1
2 C03 CT2
C24
4
5 C56
SELECT
MOVE PROG
ERASE PROG

continued

Manual setup — Changing/disabling programme positions (continued)

3 Press CLEAR.

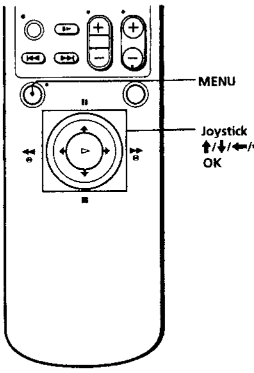
The selected row will be cleared as shown on the right.


PROG CH NAME
1 C12 CT1
2 C03 CT2
4
5 C56
SELECT :
MOVE PROG :
ERASE PROG :

4 Repeat steps 2 and 3 for any other programme positions you want to disable.

5 Press MENU to exit the menu.

Manual setup — Listing the channels as the TV

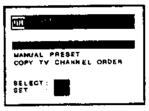


You can match the channels for the programme positions preset in the VCR with the ones preset in the connected TV if you have connected the VCR to your TV using the EURO-AV cable.

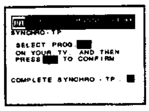
Before you start...

- turn on the VCR and the TV

1 Press MENU, then push the joystick to ↑/↓ to highlight SETTINGS and press the joystick (OK). Push the joystick to ↑/↓ to highlight TUNER and press the joystick (OK).


MANUAL PRESET
COPY TV CHANNEL ORDER
SELECT :
SET :

2 Push the joystick to ↑/↓ to highlight COPY TV CHANNEL ORDER then press OK.


SYNCHRO-TP
SELECT PROG.
ON YOUR TV. AND THEN
PRESS TO CONFIRM
COMPLETE SYNCHRO-TP :

If you use SMARTLINK connection, you don't need to do the following steps. Listing the channels as the TV will be automatically finished when the normal picture appears.

If you don't use SMARTLINK connection, go to step 3.

3 Select the same programme position on your TV as the one shown on the screen.

continued

Manual setup — Listing the channels as the TV (continued)

4 Press OK. SYNCHRO-TP (Synchro Tuner Preset) automatically starts searching for the same channel and presets it in the selected programme position.

5 To match other programme positions, repeat steps 3 to 4.

6 Push the joystick to ➡ to complete SYNCHRO-TP

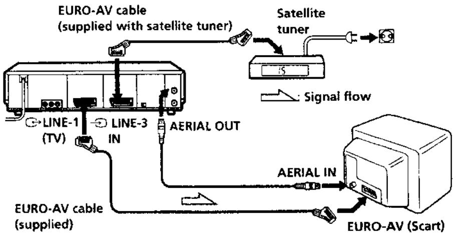
Notes

- Depending on the TV, some VCR channels may not match the channels preset in the TV. In this case, set the channels manually (see page 23).
- If you can't list the channels as the TV, try the Auto Set Up function (see page 16) first. Then follow the steps above.
- Whenever you operate the Auto Set Up function, some of the settings (ShowView, timer etc.) will be reset. In this case, you have to set them again.
- If your TV as two or more EURO-AV (Scart) connectors, connect the VCR to the EURO-AV 1 (Scart 1) connector to use the Synchro TP function.

Manual setup — Using the satellite tuner

Connecting the satellite tuner

You can connect a satellite tuner into LINE-3 IN connector .

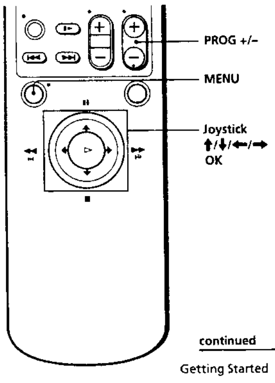


Setting the satellite tuner

To watch or record from the satellite tuner, set your VCR to receive the channels using the on-screen display.

Before you start...

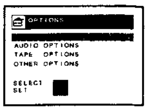
- turn on the VCR and the TV
- set the TV to the video channel.



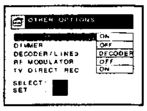
continued

Manual setup — Using the Satellite tuner (continued)

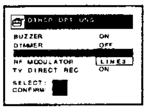
1 Press MENU, then push the joystick to ↑/↓ to highlight OPTIONS and press the joystick (OK).


OPTIONS
AUDIO OPTIONS
TAPE OPTIONS
OTHER OPTIONS
SELECT
SET

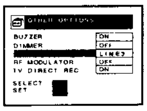
2 Push the joystick to ↑/↓ to highlight OTHER OPTIONS and press the joystick (OK).


OTHER OPTIONS
ON
DIMMER
OFF
DECODER/LINE3
DECODER
RF MODULATOR
OFF
TV DIRECT REC
ON
SELECT
SET

3 Push the joystick to ↑/↓ to highlight DECODER/LINE 3 and press the joystick (OK) to enter the pop up menu.


OTHER OPTIONS
BUZZER
ON
DIMMER
OFF
RF MODULATOR
LINE3
TV DIRECT REC
ON
SELECT
CONFIRM

4 Push the joystick to ↑/↓ then select LINE3. Press the joystick (OK).

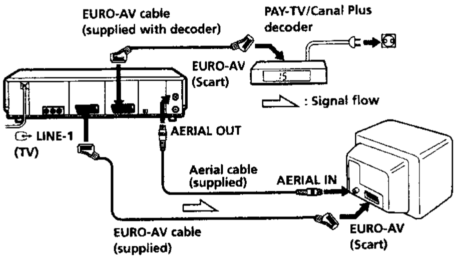

OTHER OPTIONS
BUZZER
ON
DIMMER
OFF
LINE3
RF MODULATOR
OFF
TV DIRECT REC
ON
SELECT
SET

5 Press MENU to exit the menu.

Setting the PAY-TV/Canal Plus decoder

You can watch or record PAY-TV/Canal Plus programmes if you connect a decoder (not supplied) to the VCR.

Connecting a decoder

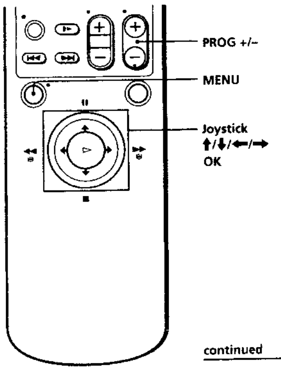

EURO-AV cable (supplied with decoder)
PAY-TV/Canal Plus decoder
EURO-AV (Scart)
: Signal flow
LINE-1 (TV)
AERIAL OUT
Aerial cable (supplied)
AERIAL IN
EURO-AV cable (supplied)
EURO-AV (Scart)

Setting PAY-TV/Canal Plus channels

To watch or record PAY-TV/Canal Plus programmes, set your VCR to receive the channels using the on-screen display.

Before you start...

- turn on the VCR and the TV
- set the TV to the video channel.

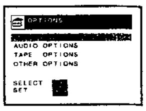

PROG +/–
MENU
Joystick
↑/↓/←/→
OK

continued

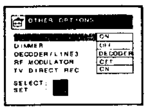
Setting the PAY-TV/Canal Plus decoder (continued)

1 Turn on your decoder.

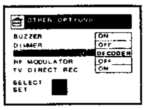
2 Press MENU, then push the joystick to ↑/↓ to highlight OPTIONS and press the joystick (OK).


OPTIONS
AUDIO OPTIONS
TAPE OPTIONS
OTHER OPTIONS
SELECT
SET

3 Push the joystick to ↑/↓ to highlight OTHER OPTIONS and press the joystick (OK).

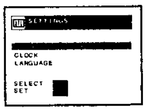

OTHER OPTIONS
ON
DIMMER
OFF
DECODER/LINE3
DECODER
RF MODULATOR
OFF
TV DIRECT REC
ON
SELECT
SET

4 Push the joystick to ↑/↓ to highlight DECODER/LINE 3. Press the joystick (OK) to enter the pop up menu, push the joystick to ↑/↓ then select DECODER. Press the joystick (OK).

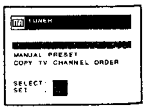

OTHER OPTIONS
BUZZER
ON
DIMMER
OFF
DECODER
RF MODULATOR
OFF
TV DIRECT REC
ON
SELECT
SET

5 Press MENU to exit the menu.

6 Press MENU, then push the joystick to ↑/↓ to highlight SETTINGS and press the joystick (OK).

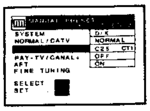

SETTINGS
CLOCK
LANGUAGE
SELECT
SET

7 Push the joystick to ↑/↓ to highlight TUNER and press the joystick (OK).


TUNER
MANUAL PRESET
COPY TV CHANNEL ORDER
SELECT
SET

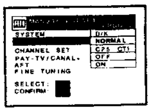
---

8 Push the joystick to ↑/↓ to highlight MANUAL PRESET and press the joystick (OK).

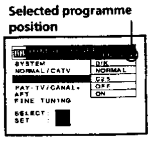

MANUAL PRESET
SYSTEM
D/K
NORMAL/CATV
NORMAL
C25 CT1
PAY-TV/CANAL+
OFF
AFT
ON
FINE TUNING
SELECT
SET

9 Push the joystick to ↑/↓ to highlight NORMAL/CATV. Press the joystick (OK). Push the joystick to ↑/↓ to select NORMAL then press the joystick (OK).

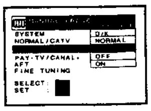
To preset CATV channels, select CATV.


SYSTEM
D/K
NORMAL
CHANNEL SET
C25 CT1
PAY-TV/CANAL+
OFF
AFT
ON
FINE TUNING
SELECT
CONFIRM

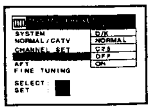
10 Press PROG +/– to select the desired programme position.


Selected programme position
SYSTEM
D/K
NORMAL/CATV
NORMAL
C25
PAY-TV/CANAL+
OFF
AFT
ON
FINE TUNING
SELECT
SET

11 Press the joystick (OK) to enter the channel set box, then push the joystick to ↑/↓ to tune PAY-TV/Canal Plus channels.
When the desired channel is tuned, press the joystick (OK).


SYSTEM
D/K
NORMAL/CATV
NORMAL
PAY-TV/CANAL+
OFF
AFT
ON
FINE TUNING
SELECT
SET

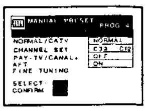
12 Push the joystick to ↑/↓ to highlight PAY-TV/CANAL+and press the joystick (OK) to enter the pop up menu, then push the joystick to ↑/↓ to select ON. Press the joystick (OK).


SYSTEM
D/K
NORMAL/CATV
NORMAL
CHANNEL SET
C25
OFF
AFT
ON
FINE TUNING
SELECT
SET

continued

Setting the PAY-TV/Canal Plus decoder (continued)

13 If the TV sound is distorted or noisy, push the joystick to ↑/↓ /←/→ to highlight SYSTEM, then select B/G or D/K so that you get the better sound

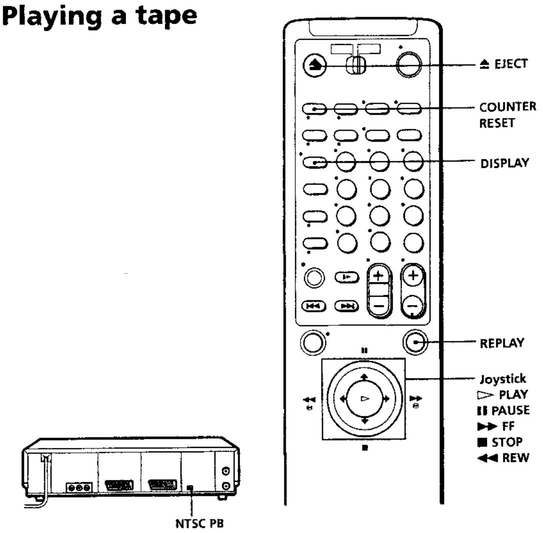

MANUAL PRESET PROG 4
NORMAL/CATV NORMAL
CHANNEL SET C12 C12
PAY-TV/CANAL+ OFF
AFT ON
FINE TUNING
SELECT: CONFIRM

14 •MENU Press MENU to exit the menu.

Notes

- The menu disappears automatically if you don't proceed more than a few minutes.
- To superimpose subtitles while watching PAY-TV/Canal Plus programmes, make both decoder-VCR and VCR-TV connections using 21-pin EURO-AV cables that are compatible with the RGB signals. You cannot record subtitles on the VCR.
- When you watch PAY-TV/Canal Plus programmes using the aerial input of the TV, press TV/VIDEO so that the VIDEO indicator appears in the display window.

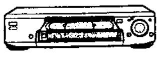
Playing a tape



1 Turn on your TV and set it to the video channel.

2 Insert a tape.

The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed.



3 Press the joystick (▷ PLAY).

When the tape reaches the end, it will rewind automatically.

continued

Playing a tape (continued)

Additional tasks

To	Push Joystick to
Stop play	■ STOP
Pause play	II PAUSE
Resume play after pause	II PAUSE or press the joystick (▷ PLAY)
Search forward	▶▶ FF during playback
Search backward	◀◀ REW during playback
Fast-forward the tape	▶▶ ⊜ FF during stop
Rewind the tape	◀◀ ⊜ REW during stop
Eject the tape	Press ≜ EJECT

To replay a recently watched scene

You can immediately rewind and playback the scene you want to watch again.

During playback, press REPLAY up to four times. The VCR rewinds the tape 10 seconds for each press of the button, and restarts playback.

To set the colour system

If the playback picture has no colour or streaks appear during playback, set the COLOUR SYSTEM option in the VIDEO OPTIONS menu to conform to the system that the tape was recorded in (see page 66). (Normally set the option to AUTO)

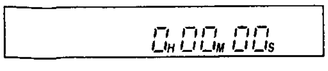
To play an NTSC-recorded tape

Set NTSC PB at the rear of the VCR according to the colour system of your TV.

When your TV is	Set NTSC PB to
PAL only	ON PAL TV
PAL and NTSC	NTSC 4.43

To use the time counter

At the point of the tape that you want to find later, press COUNTER RESET. The counter in the display window resets to "0H00M00S." Search for the point afterwards by referring to the counter.



To display the counter on the TV screen, press DISPLAY.

Notes

- Depending on your TV, the following may occur while playing an NTSC-recorded tape:
  - The picture becomes black and white.
  - The picture shakes.
  - No picture appears on the TV screen.
  - Black streaks appear horizontally on the TV screen.
  - The colour density increases or decreases.
- If you play back a tape in LP or EP mode with NTSC system, the sound is heard in monaural.
- The counter resets to "0H00M00S" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.
- While setting the menu on the TV screen, you cannot use the joystick for tape operation.

Starting playback automatically with one button (One Touch Play)

If you use the SMARTLINK connection, you can turn on the VCR and the TV, set the TV to the video channel, and start playback automatically with one button.

1. Insert a tape.

   The VCR automatically turns on.

   If you insert a tape with its safety tab removed, the TV turns on and switches to the video channel. Playback starts automatically.

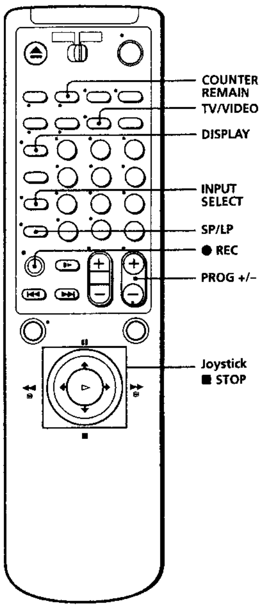
2. Press the joystick (▷ PLAY).

   The TV turns on and switches to the video channel automatically. Playback starts.

Tip

- When there already is a tape in the VCR, the VCR and the TV turn on, the TV is set to the video channel, and playback starts automatically in one sequence when you press the joystick (▷ PLAY).

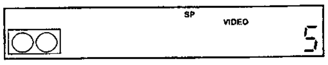
Recording TV programmes



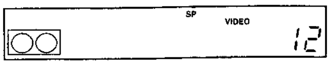
1 Turn on your TV and set it to the video channel.

2 Insert a tape with its safety tab in place.

3 INPUT SELECT — Press INPUT SELECT until a programme position number appears in the display window.

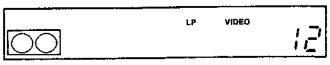


4 PROG — Press PROG +/– to select the programme position you want to record.

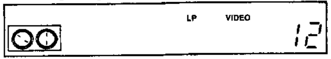


5 SP/LP — Press SP/LP to select the tape speed, SP or LP.

LP (Long Play) provides recording time twice as long as SP (Standard Play), however, SP produces better picture and audio quality.



6 ●REC — Press ● REC to start recording.
The recording indicator lights up red in the display window.

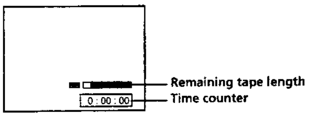


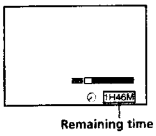
To stop recording

Push joystick ↓ (■ STOP).

To check the remaining tape length

Press DISPLAY. The white bar indicates the approximate length of tape remaining. With the display on, press COUNTER/REMAIN to check the remaining time. Each time you press COUNTER/REMAIN, the time counter and the remaining time appear alternately. The remaining time with the ⏲ indicator also appears in the display window.





continued

Recording TV programmes (continued)

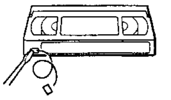
In order to get an accurate remaining time indication, be sure the TAPE SELECT item in TAPE OPTIONS menu is set according to the tape type you use (see page 67).

To watch another TV programme while recording

1. Press TV/VIDEO on the remote commander to turn off the VIDEO indicator in the display window.
2. Select another programme position on the TV.

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on a tape again, cover the tab hole with adhesive tape.



Safety tab

Tips

- To select a programme position, you can use the programme number buttons on the remote commander. For two-digit numbers, press the -/-- (ten's digit) button followed by the programme number buttons.
- You can select a video source from the LINE-1 (TV) or LINE-3 IN (Scart) connector, or the LINE-2 IN jacks using INPUT SELECT.
- The display appears on the TV screen indicating information about the tape, but the information won't be recorded on the tape.
- If you don't want to watch TV while recording, you can turn off the TV.

Notes

- The display does not appear during still (pause) mode or slow-motion playback.
- The display will not appear while playing an NTSC-recorded tape.
- If a tape has portions recorded in both PAL and NTSC systems, the time counter reading will not be correct. This discrepancy is due to the difference between the counting cycles of the two video systems.
- You cannot watch PAY-TV/Canal Plus programme while recording another PAY-TV/Canal Plus programme.
- When you insert a tape with a short tape length such as E-30 or a non-standard commercially available tape, the remaining tape counter may not be correct.
- The remaining tape counter doesn't work for an NTSC-recorded tape. "-:--" appears in the display window.
- The remaining tape counter is intended for rough measurement only.
- The remaining time will be displayed only about 30 seconds after the tape is inserted and operated for a few moments.

Recording what you are watching on the TV (TV DIRECT REC)

If you use the SMARTLINK connection, you can easily record what you are watching on the TV (other than tapes being played on this VCR).

1. Insert a tape with its safety tab in place.
2. Press ● REC while you are watching a TV programme or external source.

   The VCR automatically turns on and starts recording what you are watching on the TV.

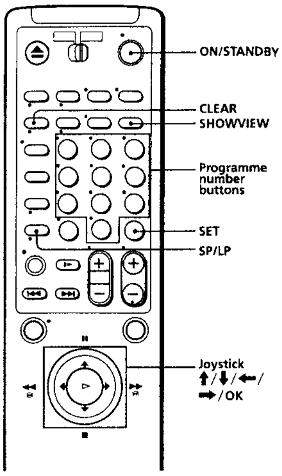
Tips

- The TV indicator appears in the display window after you press ● REC in some situations such as:
  - when you are watching a source connected to the TV's line input, or
  - when the TV tuner preset data for the programme position is different from the data in the VCR tuner preset.
- If there is a tape with its safety tab in place in the VCR, the VCR automatically turns on and starts recording what you are watching on the TV when you press ● REC.
- You can turn the TV DIRECT REC function on and off in the OTHER OPTIONS menu of the OPTIONS menu (see page 68).

Notes

- You cannot record what you are watching using this method when the VCR is in the following modes: pause, timer standby, tuner preset, Auto Set Up, and recording.
- When the TV indicator is lit in the display window, do not turn off the TV nor change the TV programme position. When the TV indicator is not lit, the VCR continues recording the programme even if you change the TV programme position on the TV.

Recording TV programmes using ShowView



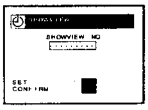
Just enter the programme's ShowView number listed in the TV programme guide. The date, times, and programme position of that programme are set automatically. You can preset up to eight programmes at a time.

Before you start...

- Check that the VCR clock is set to the correct time and date (see page 19).
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- If you don't use the SMARTLINK connection, turn on your TV and set it to the video channel.
- If you use the SMARTLINK connection, go to step 1.

1 SHOWVIEW

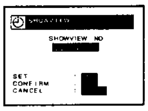
Press SHOWVIEW.



2 1 2 3 4 5 6 7 8 9 0 CLEAR

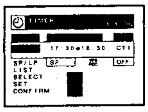
Press the programme number buttons to enter the programme's ShowView code.

If you make a mistake press CLEAR and re-enter the correct number.



3 SET

Press SET.
The date, start and stop times, programme position, and tape speed appear on the TV screen.



If "- -" appears in the programme column (this may happen for local broadcasts), you have to set the appropriate programme position manually. Push joystick ↑/↓ to select the desired programme position. You will only have to do this operation once for the referred channel. The VCR will then store your setting. If you want to record a satellite broadcast, select the LINE on which your satellite tuner is connected (see page 35).

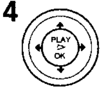
If you want to change the date, time, tape speed, and the VPS/PDC function setting:

1 Push joystick ←/→ to highlight the item you want to change.

2 Push joystick ↑/↓ to reset it.

- to record the same programme every day or the same day every week, see "Daily/weekly recording" on page 50.
- to use the VPS/PDC function, set VPS/PDC to ON. For details of the VPS/PDC function, see "Timer recording with VPS/PDC signals" on page 50.

4



Press joystick (OK) to confirm the setting.

5 ON/STANDBY

Press ON/STANDBY to turn off the VCR.
The ⏻ indicator appears in the display window and the VCR stands by for recording.

To stop recording

To stop the VCR while recording, push joystick ↓ (■ STOP).

continued

Recording TV programmes using ShowView (continued)

Daily/weekly recording

In step 2 above, push the joystick to ↓ to select the recording pattern. Each time you push the joystick to ↓, the indication changes as shown below. Push the joystick to ↑ to change the indication in reverse order.

TODAY → SUN-SAT (Sunday to Saturday) → MON-SAT (Monday to Saturday) → MON-FRI (Monday to Friday) → SAT (every Saturday) ..... → MON (every Monday) → SUN (every Sunday) → 1 month later →(dates count down) → TOMORROW →TODAY

Timer recording with VPS/PDC signals

Some broadcast systems transmit VPS (Video Programme System)/PDC (Programme Delivery Control) signals with their TV programmes. These signals ensure that your timer recordings are made regardless of broadcast delay, early starts or broadcast interruptions.

In step 3 above, push the joystick to ↑/↓ to turn on/off the VPS/PDC indication after you set the recording date. If you do not want to set the VPS/PDC function, turn off the VPS/PDC indication.

You can also use the VPS/PDC function for a source connected to the LINE-1 (TV) and LINE-3 IN connectors, and LINE-2 IN jacks.

Tips

- For two digit numbers, press the -/-- (ten digit) button followed by the programme number button.
- To set the programme position, you can also use the PROG +/– or programme number buttons.
- To set the tape speed, you can also use SP/LP.
- To set the start and stop times, you can also use programme number buttons.

Notes

- When setting the timer with VPS/PDC signals, enter the start and stop times exactly as indicated in the TV programme guide, otherwise the VPS/PDC function won't work.
- If the VPS/PDC signal is too weak or the broadcasting station failed to transmit VPS/PDC signals, the VCR will start recording at the set time without using the VPS/PDC function.
- The ⏻ indicator flashes in the display window when you press ON/STANDBY with no tape inserted.

To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press ON/STANDBY. The ⏻ indicator turns off and the VCR switches on. Remember to press ON/STANDBY to reset the VCR after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV programme.

Tips

- To cancel the "Recording TV programmes using ShowView" procedure, press SHOWVIEW before pressing SET.
- In step 4 above, you can check the TIMER LIST by selecting LIST and pressing OK. Press OK again to return to the former screen.
- When you are recording a programme in the SP mode and the remaining tape becomes shorter than the recording time, the tape speed is automatically changed to the LP mode. Note that some interference will appear on the picture at the point the tape speed is changed. If you want to keep the same tape speed, set AUTO LONG PLAY to OFF in the TAPE OPTIONS menu (see page 67).

Note

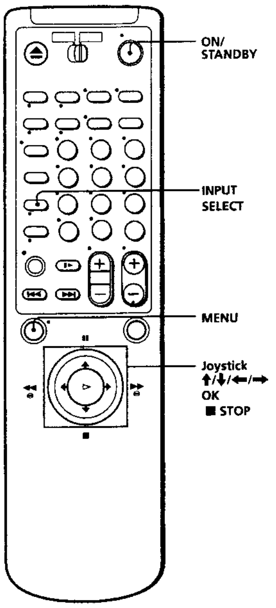
- If the VCR beeps repeatedly, this means that the programme's ShowView number is incorrect.

Setting the timer manually

If ShowView is not available in your area, follow the instructions below to set the timer to record programmes.

Before you start...

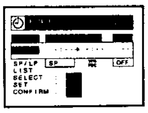
- Check that the VCR clock is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- If you don't use the SMARTLINK connection, turn on your TV and set it to the video channel.



1 MENU

Press MENU.

Push the joystick to ↑/↓ to highlight TIMER, then press the joystick (OK).



2 Set the date, start and stop times, programme position, tape speed and the VPS/PDC function:

1 Push the joystick to ➡ to highlight each item in turn.

2 Push the joystick to ↑/↓ to set each item.

To correct a setting, push the joystick to ⬅ to reset.

- To record the same programme every day or the same day every week, see "Daily/weekly recording" on page 54.
- If you don't want to use the VPS/PDC function, see "Timer recording with VPS/PDC signals" on page 50.
- INPUT SELECT — To record from other sources connected to the LINE-1 (TV) or LINE-3 IN (Scart) connector, or LINE-2 IN jacks, press INPUT SELECT to display "L1," "L2," or "L3" in the "PROG" position.

3 Press OK to confirm the setting.

4 ON/STANDBY — Press ON/STANDBY to turn off the VCR.

The ⏻ indicator appears in the display window and the VCR stands by for recording.

To record from other sources, leave the connected equipment switched on.

To stop recording

To stop the VCR while recording, push the joystick to ↓ (■ STOP).

continued

Setting the timer manually (continued)

Daily/weekly recording

In step 2 above, push the joystick to ↓ to select the recording pattern. Each time you push the joystick to ↓, the indication changes as shown below. Push the joystick to ↑ to change the indication in reverse order.

TODAY → SUN-SAT (Sunday to Saturday) → MON-SAT (Monday to Saturday) → MON-FRI (Monday to Friday) → SAT (every Saturday) ..... → MON (every Monday) → SUN (every Sunday) → 1 month later →(dates count down) → TOMORROW →TODAY

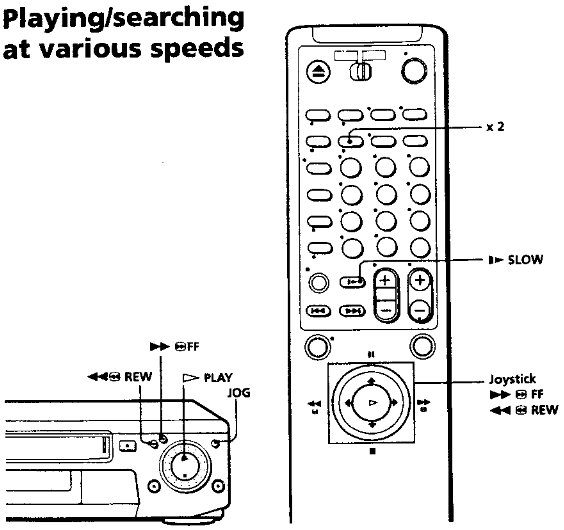
Tips

- To set the programme position, you can also use the PROG +/– or programme number buttons.
- To set the tape speed, you can also use SP/LP.
- In step 2 above, you can check the TIMER LIST by selecting LIST and pressing the joystick (OK). Press the joystick (OK) again to return to the former screen.
- When you are recording a programme in the SP mode and the remaining tape becomes shorter than the recording time, the tape speed is automatically changed to the LP mode. Note that some interference will appear on the picture at the point the tape speed is changed. If you want to keep the same tape speed, set AUTO LONG PLAY to OFF in the TAPE OPTIONS menu (see page 67).

Note

- The ⏻ indicator flashes in the display window when you press ON/STANDBY with no tape inserted.

Playing/searching at various speeds



Playback options	Operation
View the picture during fast-forward or rewind	During fast-forward, keep pushing the joystick to ▶▶⊖ FF. During rewind, keep pushing the joystick to ◀◀⊖ REW.
Play at high speed	• During playback, push the joystick to ▶▶⊖ FF or ◀◀⊖ REW. • During playback, keep pushing the joystick to ▶▶⊖ FF or ◀◀⊖ REW. When you release the joystick, resume normal playback.
Play at twice the normal speed	During playback, press × 2.
Play in slow motion	During playback, press ▮▸ SLOW.
Play frame by frame	During pause, push the joystick to ▶▶⊖ FF or ◀◀⊖ REW. Keep pushing the joystick to ▶▶⊖ FF or ◀◀⊖ REW to play one frame each second.
Rewind and start play	During stop, press ▷ PLAY on the VCR while holding ◀◀⊖ REW down on the VCR.

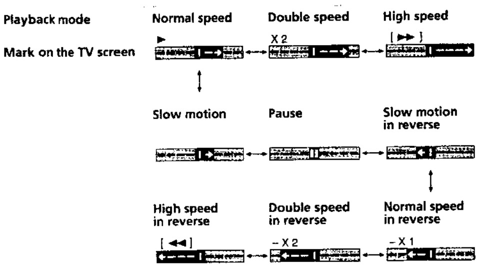
continued

Using the CLICK JOG SHUTTLE ring

With the CLICK JOG SHUTTLE ring, you can operate a variety of playback options.
There are two ways for using the CLICK JOG SHUTTLE ring, normal mode (CLICK JOG SHUTTLE ring) and jog mode (CLICK JOG ring).

To use the CLICK JOG SHUTTLE ring in normal mode

During playback or pause, turn the CLICK JOG SHUTTLE ring clockwise or anticlockwise. Each change in the CLICK JOG SHUTTLE ring position changes the playback mode, and the corresponding mark appears on the TV screen for a few seconds in the following way if the on-screen display function is on:



To use the CLICK JOG SHUTTLE ring in jog mode

Use this mode for frame-by-frame playback.
Press JOG to enter the jog mode. The JOG indicator lights up. If you change to the jog mode during any playback mode, the playback pauses so you can see a still picture. Each change in the CLICK JOG ring position shifts the picture one frame. To shift frames in reverse, turn the CLICK JOG ring anticlockwise.
The frame shift speed depends on the speed you turn the CLICK JOG ring.
To resume normal mode, press JOG again. The JOG indicator goes off.

To resume normal playback

Press the joystick (▷ PLAY).

Tip

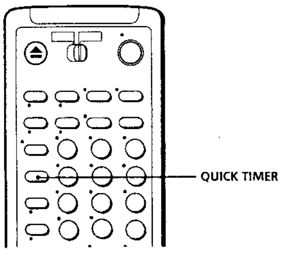
- Adjust the picture using TRACKING +/– if:
  - Streaks appear while playing in slow motion.
  - Bands appear at the top or bottom while pausing.
  - The picture shakes while pausing.

Notes

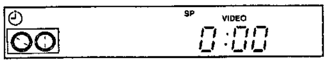
- The playback sound is muted during the operations in the above table.
- In the LP mode, noise may appear or there may be no colour.
- If the playback mode mark doesn't appear on the TV screen, press DISPLAY.

Recording TV programmes using the quick timer

After starting recording in the normal way, you can have the VCR stop recording automatically after a specified duration.



1 While recording, press QUICK TIMER once.
The ⏲ indicator appears in the display window.



2 Press QUICK TIMER repeatedly to set the duration.
Each press advances the time in increments of 30 minutes.

→ 0:00 → 0:30 → 1:00 -----→ 10:30 → 11:00

The duration decreases minute by minute to 0:00, then the VCR stops recording and turns off automatically.

To extend the duration

Press QUICK TIMER repeatedly to set to the new duration.

To stop recording

To stop the VCR while recording, push joystick ↓ (■ STOP).

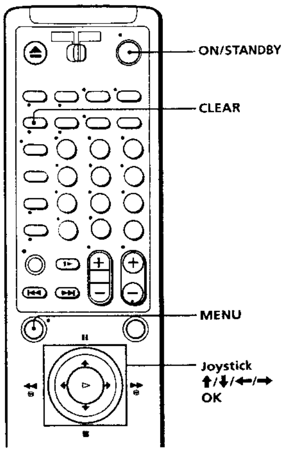
Using the quick timer during stop mode

1 Press QUICK TIMER.
2 Press PROG +/– or INPUT SELECT to select the programme position you want to record.
3 Press QUICK TIMER repeatedly to set the recording duration.
The recording starts.

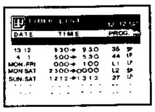
Checking/ changing/ cancelling timer settings

Before you start...

- Turn on your TV and set it to the video channel.



1 Press ON/STANDBY to turn on the VCR.
2 Press MENU, and highlight LIST, then select TIMER LIST and press the joystick (OK):
- If you want to change or cancel a setting, go on to the next step.
- If you do not need to change or cancel the settings, press MENU, then turn off the VCR to return to recording standby.



TIMER LIST 12 12 SAT

DATE	TIME	PROG.	
13 12	9 30 → 9 30	35	SP
4 1	5 00 → 5 30	44	LP
MON-FRI	0 00 → 1 00	L1	LP
MON-SAT	23 00 → 0 00	L2	SP
SUN-SAT	12 12 → 13 13	27	LP

3 Push the joystick to ↑/↓ to select the setting you want to change or cancel,
- If you want to cancel the setting, press CLEAR and skip the next step. Press MENU to exit menu.
- If you want to change the setting, press OK.

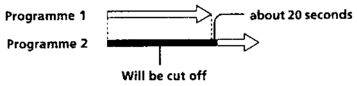
continued

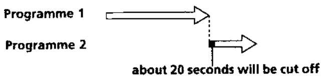
4. The selected item appears in the TIMER menu.
   - To change the setting, push the joystick to ←/→ to highlight the item you want to change, and push the joystick to ↑/↓ to reset it. To cancel the VPS/PDC function, set VPS/PDC to OFF.
5. Press the joystick (OK) to set the timer.

   If any settings remain, turn off the VCR to return to recording standby.

When the timer settings overlap

The programme that starts first has priority and the second programme starts recording only after the first programme has finished. If the programmes start at the same time, the programme listed first in the menu has priority.





Tip

- In step 5 above, you can check the TIMER LIST by selecting LISTS and pressing OK. Press MENU to exit the TIMER LIST.

Recording stereo and bilingual programmes

In ZWEITON (German stereo) system

This VCR automatically receives and records stereo and bilingual programmes based on the ZWEITON system. When a stereo or bilingual programme is received, the STEREO indicator appears in the display window.

To select bilingual sound while recording

Press AUDIO MONITOR to select the sound you want.

To listen to	On-screen display	Display window
Main	MAIN	STEREO
Sub	SUB	STEREO
Main and sub	MAIN/SUB	STEREO

Selecting the sound during playback

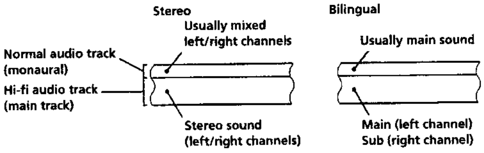
Press AUDIO MONITOR to select the sound you want.

To listen to	On-screen display	Display window
Stereo/main and sub (left and right channels)	STEREO	STEREO
Left channel/main	LCH	STEREO
Right channel/sub	RCH	STEREO
Standard sound	No indicator	No indicator

continued

How sound is recorded on a video tape

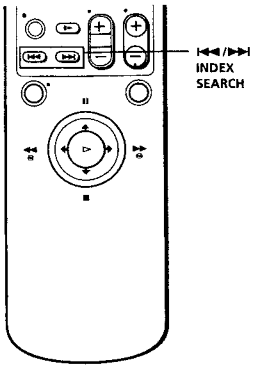
The VCR records sound onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.


Stereo
Bilingual
Usually mixed left/right channels
Usually main sound
Normal audio track (monaural)
Hi-fi audio track (main track)
Stereo sound (left/right channels)
Main (left channel)
Sub (right channel)

Notes

- To listen to playback sounds in stereo, you must use the EURO-AV or AUDIO OUT connections.
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting.
- If the AUDIO MONITOR button does not function, check that AUDIO MIX in the AUDIO OPTIONS is set to OFF.

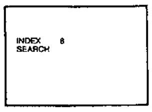
Searching using the index function



The VCR marks the tape with an index signal at the point where each recording begins. Use these signals as references to find a specific recording. The VCR can search up to 99 index signals ahead of or behind the current position.

1. Insert an indexed tape into the VCR.
2. Press ⏮/⏭ INDEX SEARCH repeatedly to specify how many index signals ahead or behind you want to search:
   - To search ahead, press ⏭ INDEX SEARCH.
   - To search backwards, press ⏮ INDEX SEARCH.

   The VCR starts searching and the index number on the TV screen counts down to zero. Playback starts automatically from that point.



To stop searching

Push the joystick to ↓ (■ STOP).

Note

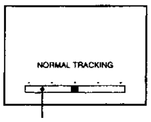
- No index signal will be added when recording starts from recording pause. However, an index signal will be marked if you change the programme position during recording pause.

Adjusting the picture

Adjusting the tracking

Although the VCR automatically adjusts the tracking when playing a tape (the tracking indicator ▩ flashes in the display window, then goes off), distortion may occur if the tape was recorded in poor condition. If so, manually adjust the tracking.

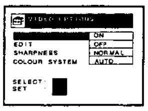
Press TRACKING +/– to display the tracking meter. The distortion should disappear as you press one of the two buttons (the ▩ indicator lights up). To resume automatic tracking adjustments, eject the tape and reinsert it or press TRACKING + and TRACKING – at the same time, so that the tracking meter comes back to the center.



Tracking meter

About Optimum Picture Control (OPC)

Optimum Picture Control (OPC) automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set OPC to ON in the VIDEO OPTIONS menu (with the OPC indicator in the display window lit). For details, see page 66.



OPC playback

The OPC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with OPC.

OPC recording

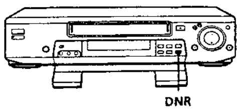
Whenever you insert a tape and start recording for the first time, the VCR adjusts to the tape using the OPC function (the OPC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

To deactivate the OPC

Press MENU and highlight OPTIONS, then VIDEO OPTIONS and set OPC to OFF. The OPC indicator in the display window goes off.

Digital Noise Reduction (DNR)

Digital Noise Reduction (DNR) automatically improves playback picture quality by the digital signal process. To obtain better picture quality, we recommend you to activate the DNR function by pressing the DNR button on the VCR (with the DNR indicator in the display window lit).

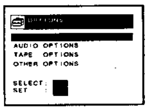


Notes

- You can adjust the tracking for the NTSC-recorded tape but the tracking meter won't be displayed.
- There is a delay of a few seconds before the VCR actually starts recording while the VCR analyses the tape. To avoid the delay, first set the VCR to recording pause (the OPC indicator flashes slowly) and press ● REC to have the VCR analyse the tape (the OPC indicator flashes rapidly). After the OPC indicator stops flashing, push ⬆ (❚❚ PAUSE) to start recording immediately. If you want to start recording quickly without using the OPC function, first set the VCR to recording pause (the OPC indicator flashes slowly) and push ⬆ (❚❚ PAUSE) to start recording.
- The DNR function does not work with MESECAM-recorded tapes.

Changing options

1 Press MENU, then select OPTIONS.



2 Push the joystick to ⬆/⬇ to highlight the kind of option to change, VIDEO OPTIONS, AUDIO OPTIONS, TAPE OPTIONS or OTHER OPTIONS then press the joystick (OK).

3 Push the joystick to ⬆/⬇ to select the option to change, then press the joystick (OK) to enter the pop up menu.

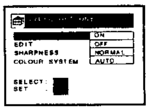
4 Push the joystick to ⬆/⬇ to select the desired setting, then press the joystick (OK) to confirm it.

5 Press MENU to exit the menu.

Menu choices

Initial settings are indicated in bold print.

VIDEO OPTIONS menu

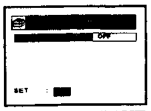


Menu option	Set this option to
OPC	• **ON** to switch on the OPC (Optimum Picture Control) function and improve picture quality. • OFF to switch off OPC. For details, see page 64.
EDIT	• ON to minimize picture deterioration when editing. • **OFF** to turn off EDIT. For details, see page 70.
SHARPNESS	• LOW to playback a poorly quality tape. • **NORMAL** to playback an average quality tape. • HIGH to playback a good quality tape.
COLOUR SYSTEM	• **AUTO** to detect automatically the colour system of a tape. • PAL to playback a tape recorded in the PAL system. • MESECAM to playback a tape recorded in the MESECAM system.

Note

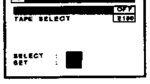
- When you playback with the EDIT function ON, the OPC and SHARPNESS functions don't work.

AUDIO OPTIONS menu



Menu option	Set this option to
AUDIO MIX	• ON to listen to the hi-fi and normal audio tracks at the same time. The AUDIO MONITOR button will not function. • **OFF** to listen to the hi-fi and normal audio tracks separately. Select the sound using the AUDIO MONITOR button. For details, see page 61.

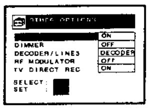
TAPE OPTIONS menu



Menu option	Set this option to
AUTO LONG PLAY	• ON to automatically record from SP (Standard Play) to LP (Long Play)when the tape lenght is not long enough. • **OFF** to normally record in SP (Standard Play). For details, see page 54.
TAPE SELECT	• **E180** to use an E-180 or shorter tape type. • E195 to use an E-195. • E240 to use an E-240. • E300 to use an E-300. For details, see page 46.

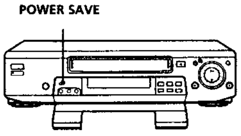
continued

OTHER OPTIONS menu


OTHER OPTIONS
BUZZER ON
DIMMER OFF
DECODER/LINE3 DECODER
RF MODULATOR OFF
TV DIRECT REC ON
SELECT :
SET :

Menu option	Set this option to
BUZZER	• **ON** to output a beep sound when any illogical operation is made. • OFF to deactivate it.
DIMMER	• ON to make the display window dim. • **OFF** to make it brighter.
DECODER/LINE 3	• **DECODER** to use the LINE-3 IN connector as the Canal Plus decoder connector. • LINE3 to use the LINE-3 IN connector as the line input connector.
RF MODULATOR	• ON if you connect the VCR to your TV using only the aerial cable. • **OFF** if you connect the VCR to your TV using only the EURO-AV cable.
TV DIRECT REC	• **ON** to activate the TV DIRECT REC function. • OFF to deactivate it.

Saving the power consumption



The POWER SAVE switch has the function of activating (OFF) and/or deactivating (ON) the indicators in the display window while the VCR is standing by, to conserve the VCR power.

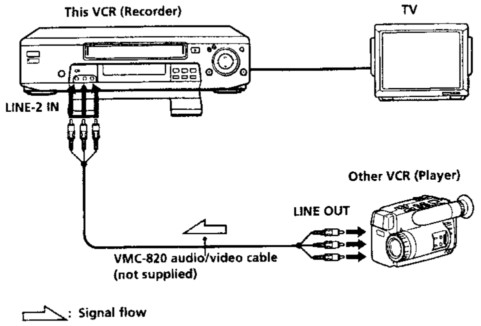
You can decrease the power consumption in standby mode to less than 4 W if you have set DECODER /LINE 3 to LINE 3 in OTHER OPTIONS menu (see page 38). If so, you will not be able to watch PAY-TV/C+ on your TV when VCR is in standby mode.

Note

- When you set a timer recording, the indicators in the display window are on even though POWER SAVE is set to ON.

Connecting to a VCR or stereo system

How to connect to record on this VCR



Tip

- You can also use the LINE-1 (TV) or LINE-3 IN connector instead.

Notes

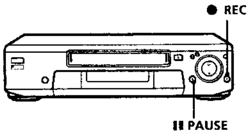
- Make sure you connect the plugs to jacks of the same colour.
- If the other VCR is a monaural type, leave the red plugs unconnected.
- If you connect this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.

How to connect to a stereo system

Connect the LINE-2 IN AUDIO L/R jacks on this VCR to the audio output jacks on the stereo system, using the RK-C510KS audio cable (not supplied).

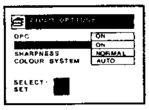
Basic editing

(when recording on this VCR)



Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT to display "L2" (or "L3") in the display window.
- Press SP/LP to select the tape speed, SP or LP.
- On this VCR, set EDIT to ON in VIDEO OPTIONS menu to display "EDIT" in the display window. If the other VCR has a similar feature, activate this one as well.


VIDEO OPTIONS
OPC ON
EDIT ON
SHARPNESS NORMAL
COLOUR SYSTEM AUTO
SELECT :
SET :

1. Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.
2. Insert a tape with its safety tab in place into this (recording) VCR. Search for the point to start recording and press ❚❚ PAUSE.
3. Press ● REC on this VCR to set it to recording pause.
4. To start editing, press the ❚❚ PAUSE buttons on both VCRs at the same time.

To stop editing

Press the ■ STOP buttons on both VCRs.

Tip

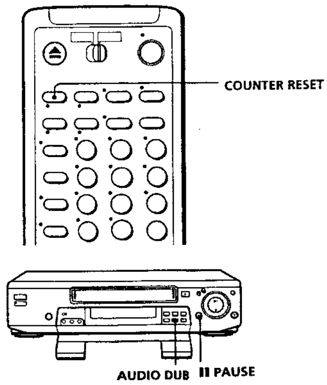
- To cut out unwanted scenes while editing, press ❚❚ PAUSE on this VCR when an unwanted scene begins. When it ends, press ❚❚ PAUSE again to resume recording (Assemble Editing).

Note

- If you start editing following the procedure above, the VCR won't start recording with the OPC function. To record a tape with the OPC function, press ● REC again during recording pause in step 3 so the VCR analyses the tape. Then, when you start editing in step 4, press ❚❚ PAUSE after the OPC indicator stops flashing. If you press ❚❚ PAUSE before the OPC indicator stops flashing, the OPC function is cancelled.

Audio dubbing

This feature lets you record over the normal audio track. The monaural sound previously recorded is replaced while the original hi-fi sound remains unchanged. Use this feature to add commentary to a tape that you have recorded with a camcorder.



Before you start dubbing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT to display "L2" or "L3" in the display window.

1. Insert a source tape into the stereo system (or the playback VCR). Search for the point to start playback and set it to playback pause.
2. Insert a prerecorded tape with its safety tab in place into this (recording) VCR. Search for the end of the section to be replaced and press ❚❚ PAUSE.
3. Press COUNTER RESET on this VCR to reset the counter to "0H00M00S."
4. Rewind the prerecorded tape to the beginning of the section to be replaced.

   The VCR enters pause mode.
5. Press AUDIO DUB.

   The audio dubbing indicator ⊖ appears in the display window.
6. To start editing, press the ❚❚ PAUSE buttons on this VCR and the stereo system (or other VCR) at the same time.

   When the counter reaches "0H00M00S," audio dubbing stops automatically.

To stop while editing

Press the ■ STOP buttons on this VCR and the stereo system (or other VCR).

continued

Audio dubbing (continued)

Note
- After you use this feature, the audio in playback mode is automatically set to monaural.

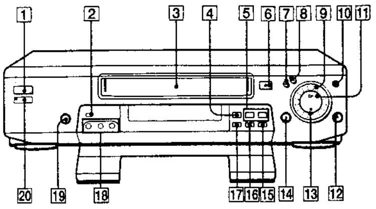
To listen to both the hi-fi and normal audio

Set AUDIO MIX to ON in the AUDIO OPTIONS menu (page 67). Use this feature to listen to dubbed audio over the original hi-fi audio. When AUDIO MIX is set to ON, the AUDIO MONITOR button does not function. Remember to reset AUDIO MIX to OFF after playing the tape.

Index to parts and controls

Refer to the pages indicated in parentheses ( ) for details.

Front panel

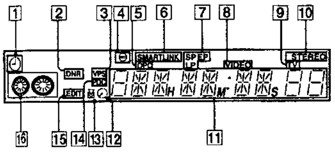


1 ON/STANDBY switch/indicator (14)
2 POWER SAVE switch (68)
3 Tape compartment
4 AUTO SET UP/RF CHANNEL button (16)
5 PROGRAM -/+ buttons TRACKING (17, 64)
6 ≜ EJECT button (42)
7 ◀◀ REW button (42, 55)
8 ▶▶ FF button (42, 55)
9 CLICK JOG SHUTTLE ring (56)
10 JOG indicator (55)
11 ▷ PLAY button (42, 55)
12 ● REC button (45,70)
13 ■ STOP button (44, 70)
14 ▮▮ PAUSE button (70)
15 DNR button (65)
16 AUDIO DUB button (71)
17 QUICK TIMER button (58)
18 LINE-2 IN VIDEO/AUDIO L/R jacks (69)
19 OPEN button (14)
20 Remote sensor (5)

continued

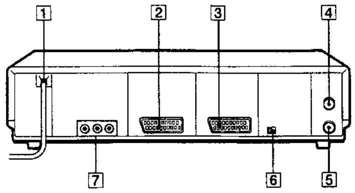
Index to parts and controls (continued)

Display window



1 TIMER indicator (49)
2 DNR indicator (65)
3 VPS indicator (50)
4 ⊜ (audio dubbing) indicator (71)
5 OPC indicator (64)
6 SMARTLINK indicator (11)
7 Tape speed indicators (45)
8 VIDEO indicator (45)
9 TV indicator (47)
10 STEREO indicator (61)
11 Line/programme position indicator/time counter/clock (14, 42, 45)
12 ◴ (remaining time) indicator (45)
13 ▩ (tracking) indicator (64)
14 PDC indicator (50)
15 EDIT indicator (70)
16 Tape/Recording indicator (45)

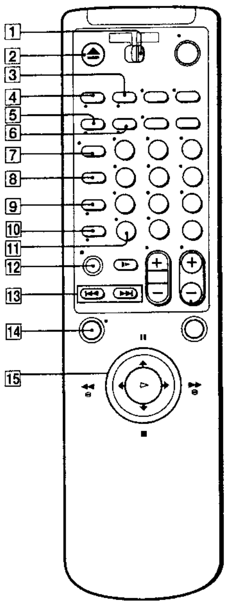
Rear panel



1 Mains lead (9, 12)
2 ⇨ LINE-1 (TV)
⇨ LIGNE-1 connector (9, 35, 37)
3 ⇦ LINE-3 IN
⇦ ENTREE LIGNE-3 connector (35)
4 AERIAL OUT
ANTENNE SORTIE connector (9, 12)
5 AERIAL IN
ANTENNE ENTREE connector (9, 12)
6 NTSC PB switch (41)
7 LINE-2 OUT AUDIO R/L/VIDEO jacks (13)

continued

Remote commander



1 TV/VIDEO remote control switch (5)

2 ≜ EJECT button (41)

3 COUNTER/REMAIN button* (44)

4 COUNTER RESET button* (41, 71)

5 CLEAR button* (31, 49, 59)

6 x 2 button* (55)

7 DISPLAY button (6, 44)

8 QUICK TIMER button* (58)

9 INPUT SELECT button (44, 52)

   ▢ TV power on/TV mode select button *(for TV)* (6)

10 SP/LP button (45)

   ⊜ (Teletext) button *(for TV)* (6)

11 -/-- (ten's digit) button (46)

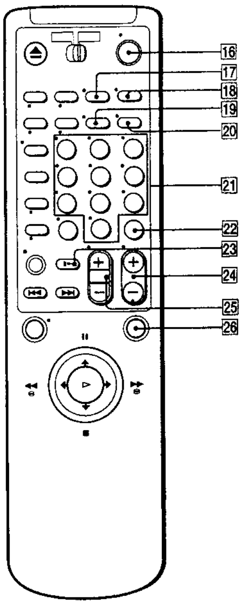
12 ● REC button (44)

13 ⏮ / ⏭ INDEX SEARCH buttons (63)

14 MENU button

15 Joystick
↑/↓/←/→
❚❚ PAUSE /■ STOP
◀◀ REW (rewind)
▶▶ FF (fast-forward)
▷ PLAY / OK

* FASTEXT buttons *(for TV)*



16 ON/STANDBY button (6)

17 WIDE button *(for TV)* (6)

18 AUDIO MONITOR button (6, 61)

19 TV/VIDEO button (46)

20 SHOWVIEW button (48)

21 Programme number buttons (6)

22 SET button (48)

23 ❚▶ SLOW button (55)

24 PROG (programme) +/– buttons (6, 24, 45)

   ▲/▼ Teletext page access buttons *(for TV)* (6)

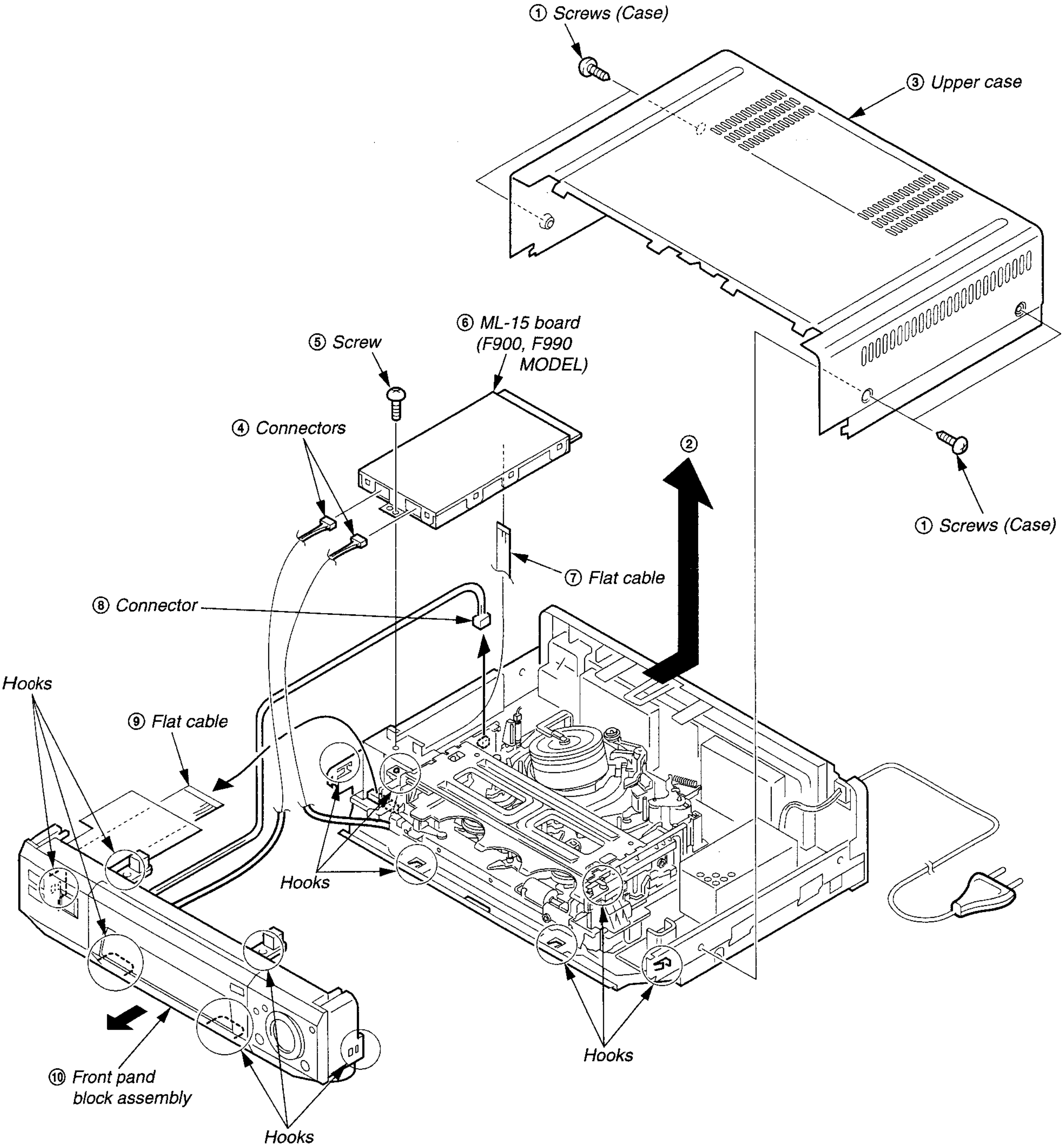
25 VOL (volume) +/– buttons *(for TV)* (6)

26 REPLAY button (41)

SECTION 2
DISASSEMBLY

NOTE : Follow the disassembly procedure in the numerical order given.

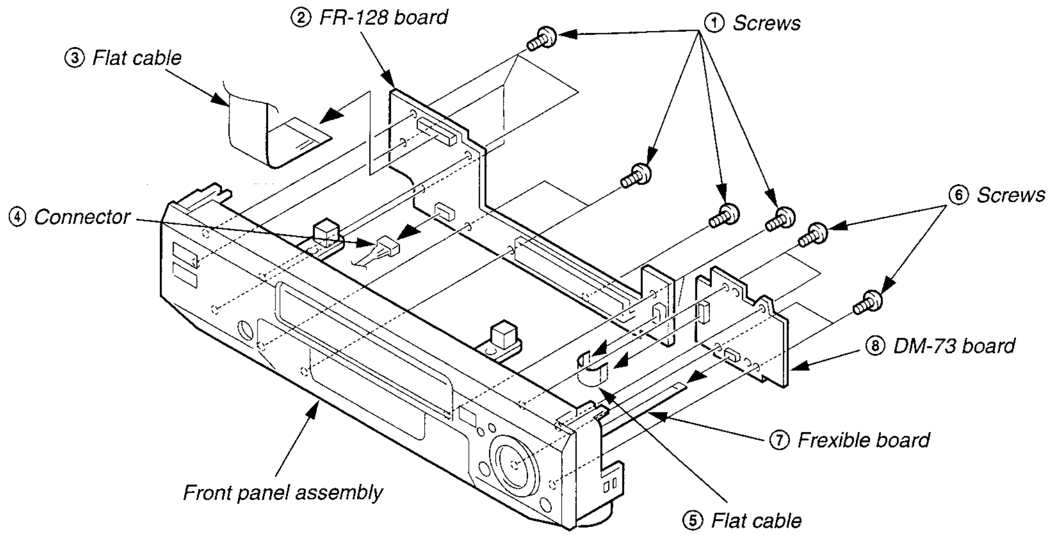
2-1. UPPER CASE, FRONT PANEL BLOCK ASSEMBLY



① Screws (Case)
③ Upper case
⑥ ML-15 board (F900, F990 MODEL)
⑤ Screw
④ Connectors
②
① Screws (Case)
⑦ Flat cable
⑧ Connector
Hooks
⑨ Flat cable
Hooks
⑩ Front pand block assembly
Hooks
Hooks

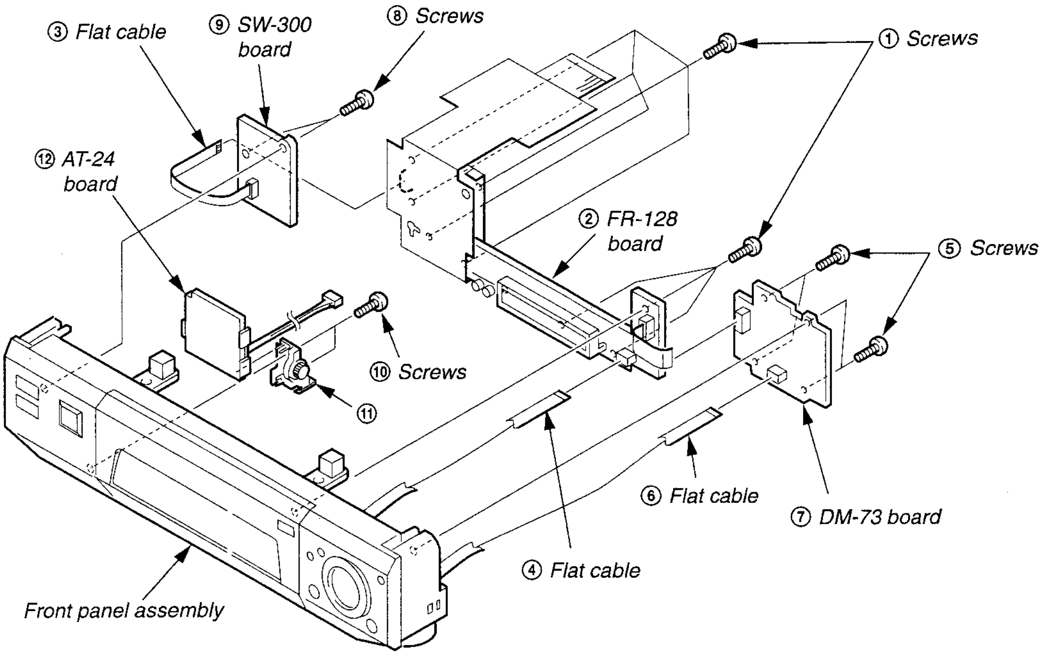
2-2. FR-128 BOARD, DM-73 BOARD

<E850, E880 MODEL>



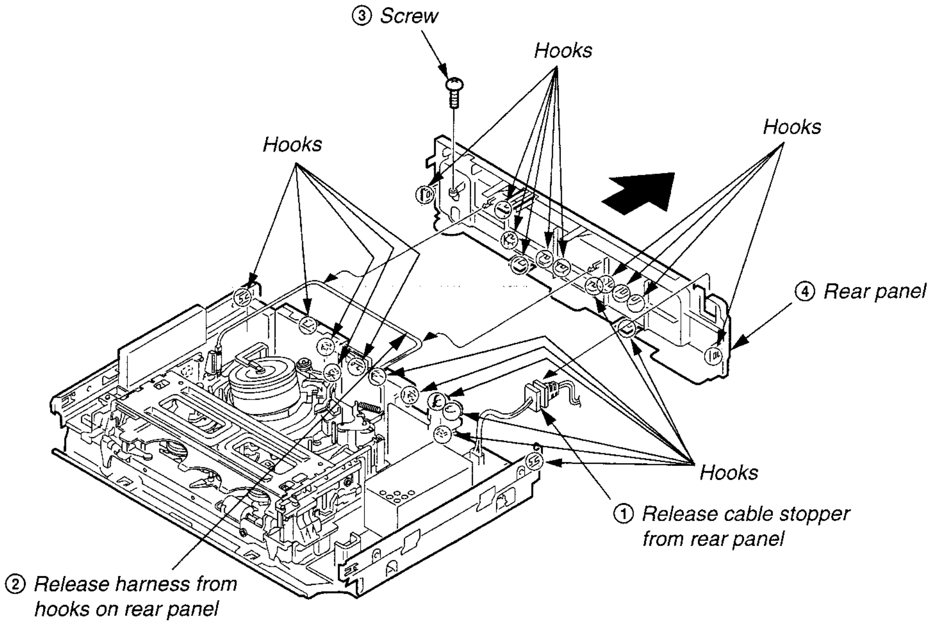
② FR-128 board
① Screws
③ Flat cable
④ Connector
⑥ Screws
⑧ DM-73 board
⑦ Frexible board
Front panel assembly
⑤ Flat cable

<F900, F990 MODEL>

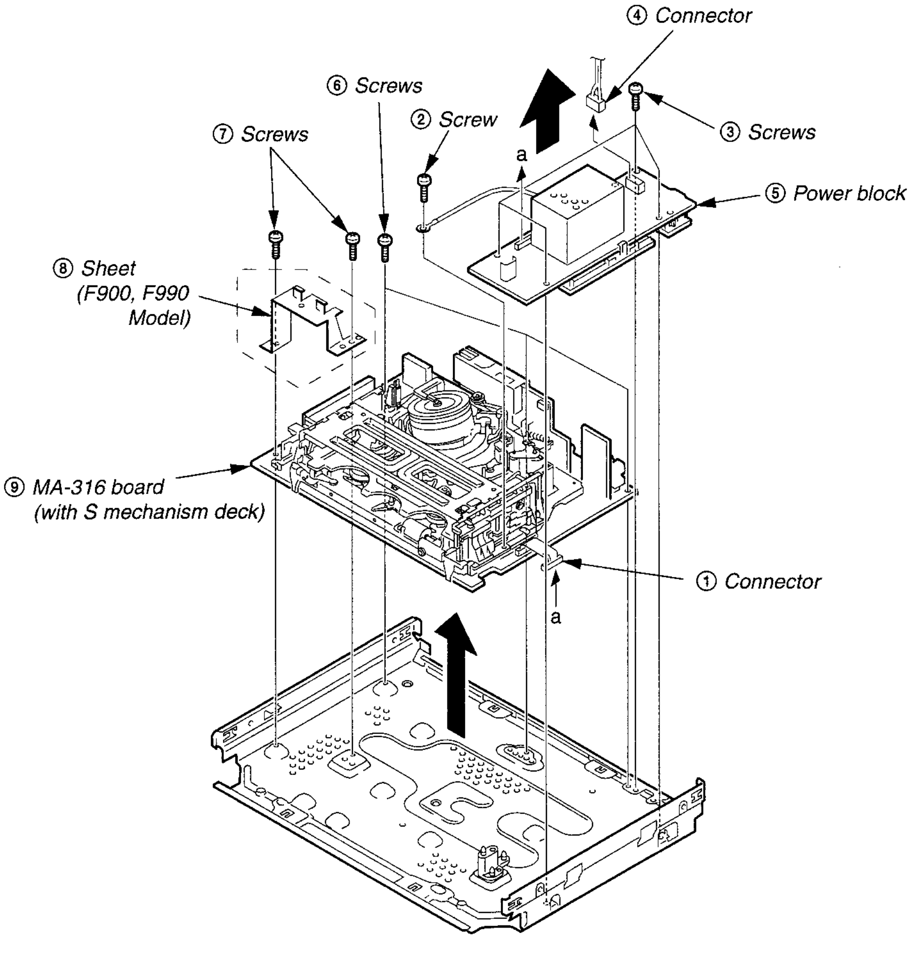


③ Flat cable
⑨ SW-300 board
⑧ Screws
① Screws
⑫ AT-24 board
② FR-128 board
⑤ Screws
⑩ Screws
⑪
⑥ Flat cable
⑦ DM-73 board
④ Flat cable
Front panel assembly

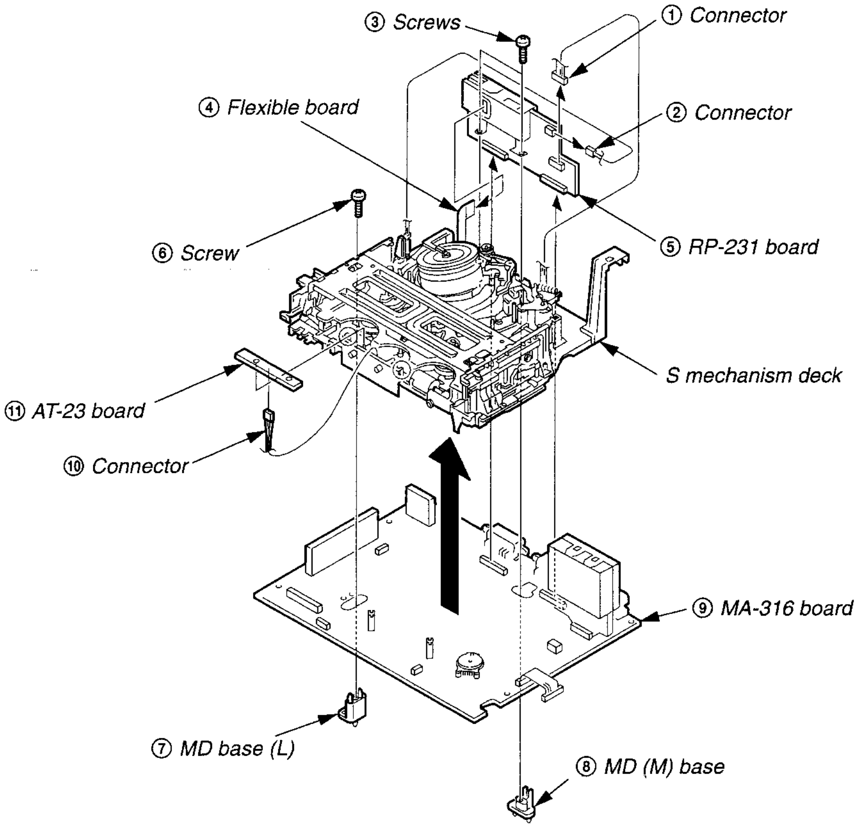
2-3. REAR PANEL


③ Screw
Hooks
Hooks
Hooks
④ Rear panel
Hooks
① Release cable stopper from rear panel
② Release harness from hooks on rear panel

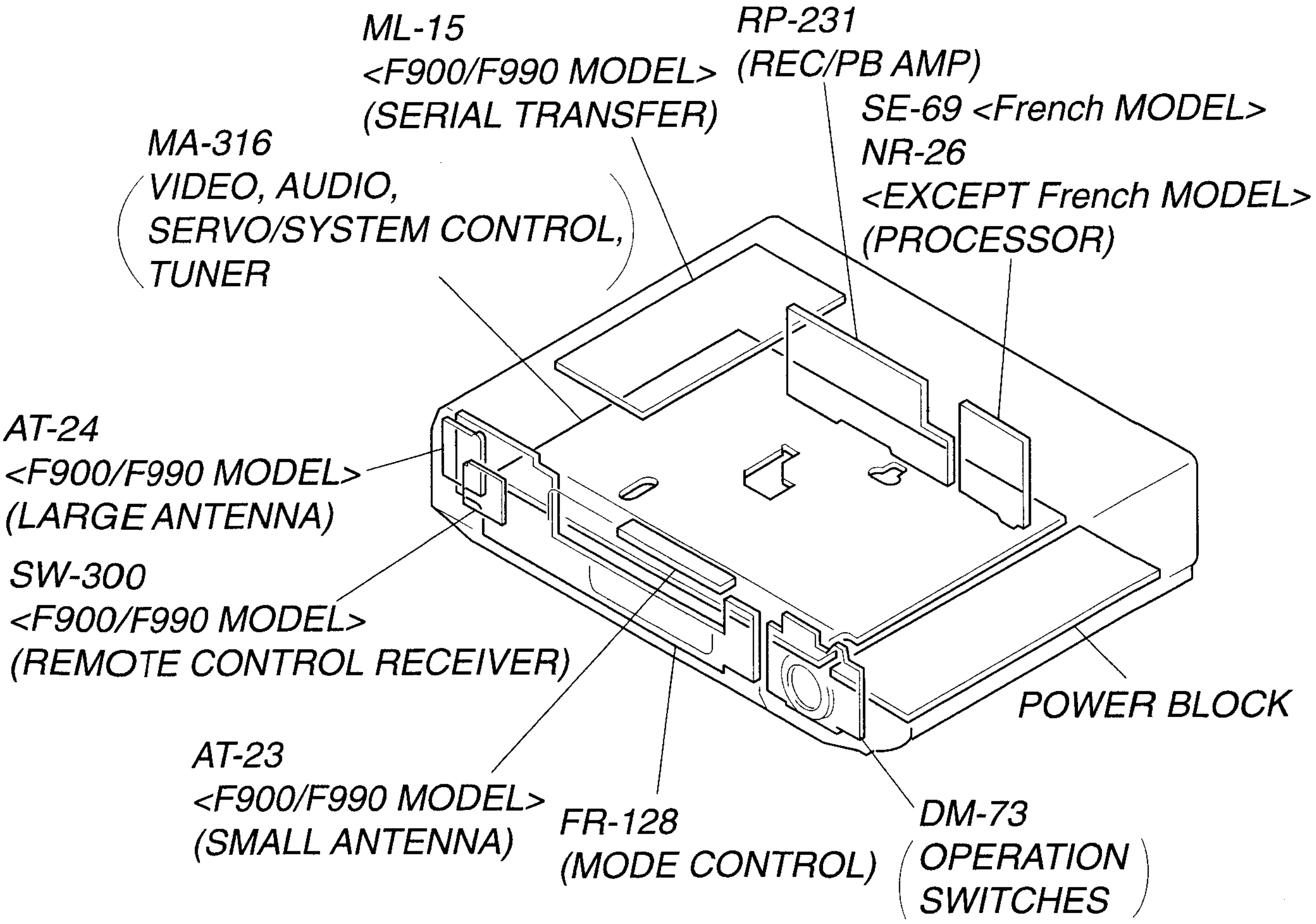
2-4. POWER BLOCK, MA-316 BOARD (WITH S MECHANISM DECK)


④ Connector
⑥ Screws
② Screw
③ Screws
⑦ Screws
a
⑤ Power block
⑧ Sheet (F900, F990 Model)
⑨ MA-316 board (with S mechanism deck)
① Connector
a

2-5. RP-231 BOARD, S MECHANISM DECK

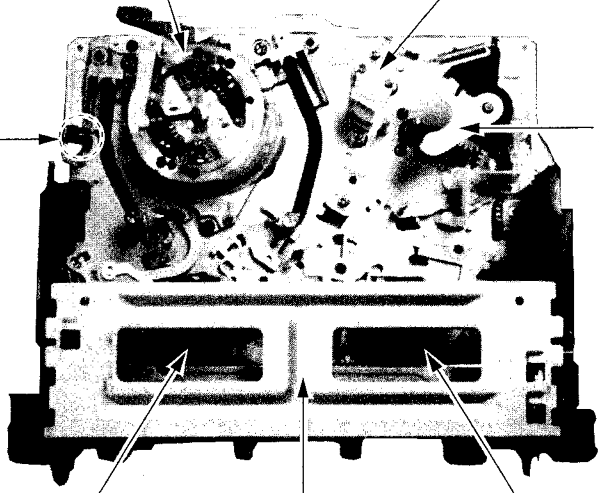

③ Screws
① Connector
④ Flexible board
② Connector
⑥ Screw
⑤ RP-231 board
S mechanism deck
⑪ AT-23 board
⑩ Connector
⑨ MA-316 board
⑦ MD base (L)
⑧ MD (M) base

2-6. CIRCUIT BOARDS LOCATION


ML-15
<F900/F990 MODEL>
(SERIAL TRANSFER)
RP-231
(REC/PB AMP)
SE-69 <French MODEL>
NR-26
<EXCEPT French MODEL>
(PROCESSOR)
MA-316
VIDEO, AUDIO,
SERVO/SYSTEM CONTROL,
TUNER
AT-24
<F900/F990 MODEL>
(LARGE ANTENNA)
SW-300
<F900/F990 MODEL>
(REMOTE CONTROL RECEIVER)
POWER BLOCK
AT-23
<F900/F990 MODEL>
(SMALL ANTENNA)
FR-128
(MODE CONTROL)
DM-73
OPERATION
SWITCHES

2-7. INTERNAL VIEWS

—Top View—



M901
Drum assembly
DZH-86A-R
1-759-373-11 (NP/VC1/VC2)
DZH-98A-R
1-759-557-11 (B)

ACE head block assembly
A-6759-620-A

FE head
1-500-144-11

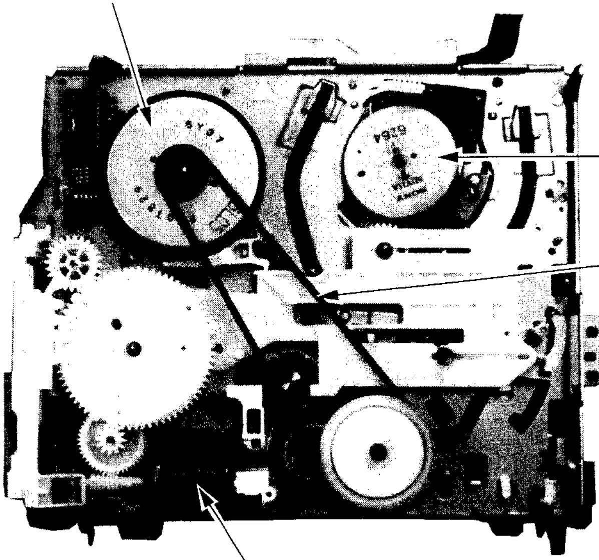
Pinch press block assembly
A-6759-615-A

FL complete assembly
A-6759-619-C

Reel (S) table
3-977-507-01

Reel (T) table
3-977-508-01

—Bottom View—



M902
DC motor (capstan)
1-698-971-11

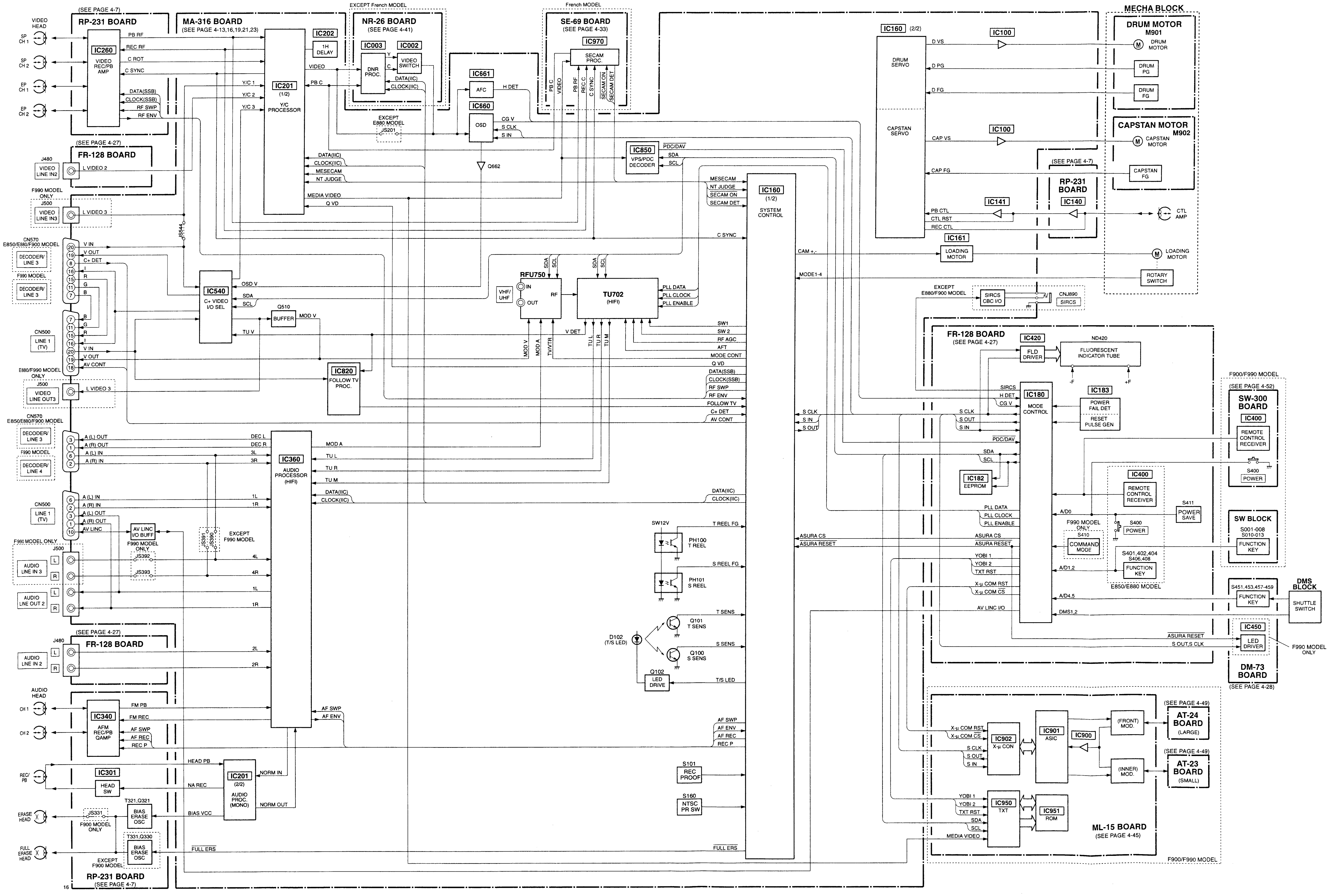
M901
Drum assembly
DZH-86A-R
1-759-373-11 (NP/VC1/VC2)
DZH-98A-R
1-759-557-11 (B)

Rubber belt
3-977-510-01

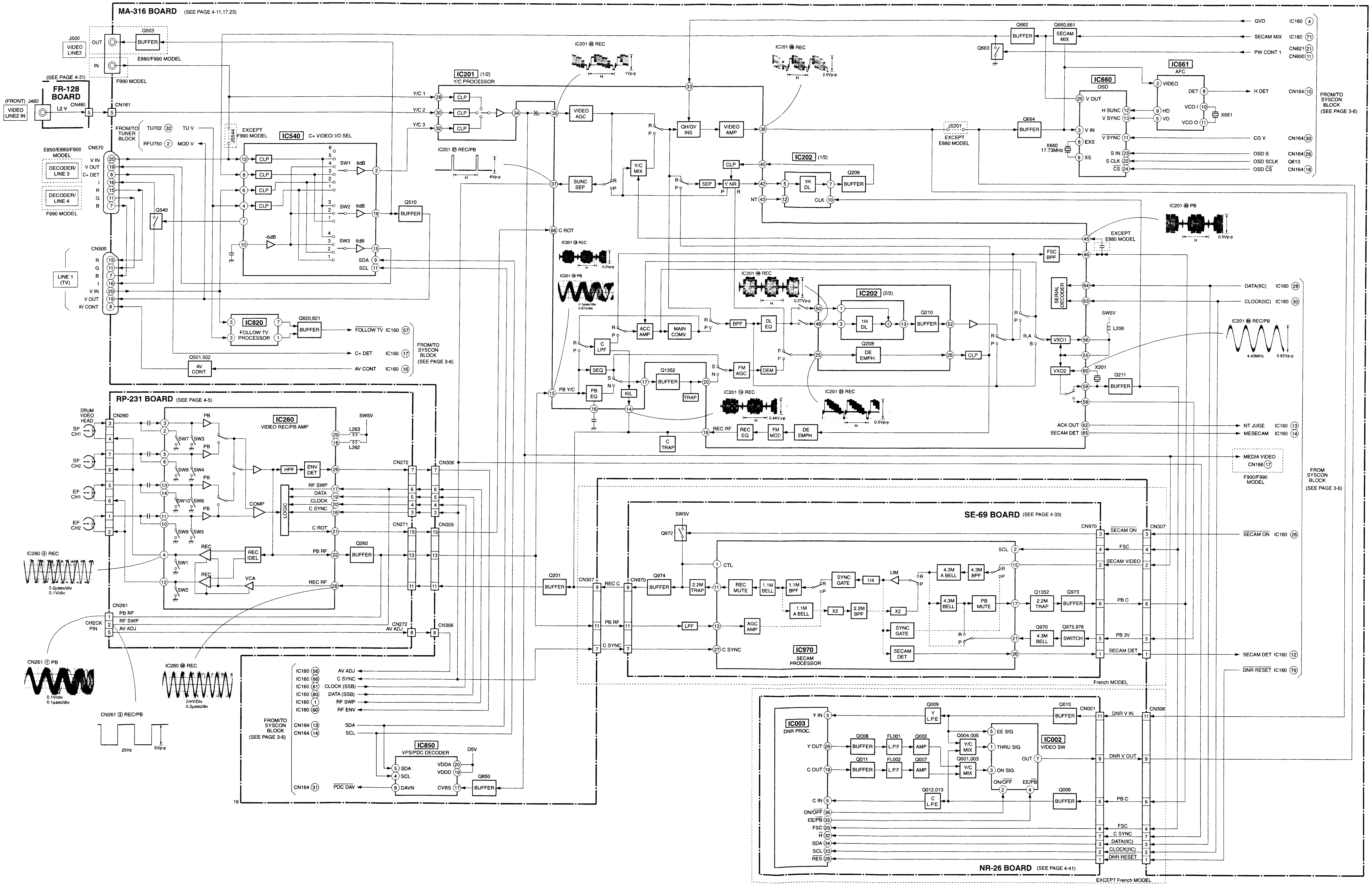
M903
Cam motor assembly
X-3947-577-1

SECTION 3
BLOCK DIAGRAMS

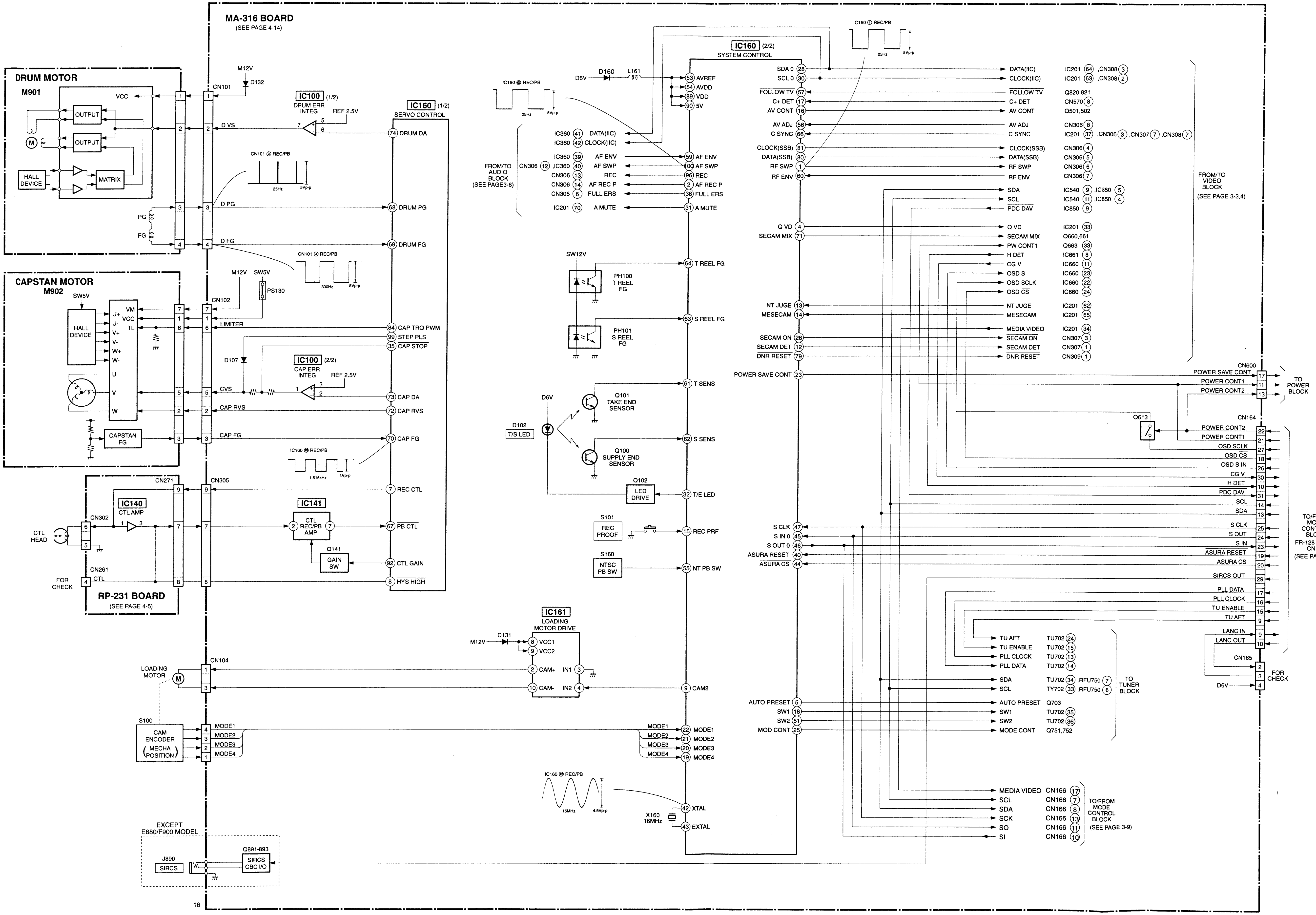
3-1. OVERALL BLOCK DIAGRAM


RP-231 BOARD
(SEE PAGE 4-7)
VIDEO HEAD
IC260 VIDEO REC/PB AMP
MA-316 BOARD
(SEE PAGE 4-13,16,19,21,23)
IC201 (1/2) Y/C PROCESSOR
IC202 1H DELAY
NR-26 BOARD
(SEE PAGE 4-41)
EXCEPT French MODEL
IC003 DNR PROC.
IC002 VIDEO SWITCH
SE-69 BOARD
(SEE PAGE 4-33)
French MODEL
IC970 SECAM PROC.
IC661 AFC
IC660 OSD
IC850 VPS/PDC DECODER
FR-128 BOARD
(SEE PAGE 4-27)
J480
J500
CN570
CN500
DECODER/ LINE 3
DECODER/ LINE 4
LINE 1 (TV)
F990 MODEL ONLY
IC540 C+ VIDEO I/O SEL
Q510 BUFFER
RFU750
VHF/ UHF
TU702 (HIFI)
IC820 FOLLOW TV PROC.
IC360 AUDIO PROCESSOR (HIFI)
AV LINC I/O BUFF
EXCEPT F990 MODEL
AUDIO LINE IN 3
AUDIO LINE OUT 2
AUDIO LINE IN 2
AUDIO HEAD
IC340 AFM REC/PB QAMP
IC301 HEAD SW
IC201 (2/2) AUDIO PROC. (MONO)
ERASE HEAD
FULL ERASE HEAD
T321,Q321 BIAS ERASE OSC
T331,Q330 BIAS ERASE OSC
EXCEPT F900 MODEL
F900 MODEL ONLY
IC160 (1/2) SYSTEM CONTROL
IC160 (2/2) DRUM SERVO CAPSTAN SERVO
IC100
IC141
IC140
IC161 LOADING MOTOR
MECHA BLOCK
DRUM MOTOR M901
DRUM PG
DRUM FG
CAPSTAN MOTOR M902
CAPSTAN FG
CTL AMP
LOADING MOTOR
ROTARY SWITCH
SIRCS CBC I/O
CN890 SIRCS
PH100 T REEL
PH101 S REEL
Q101 T SENS
Q100 S SENS
D102 (T/S LED)
Q102 LED DRIVE
S101 REC PROOF
S160 NTSC PR SW
FR-128 BOARD
IC420 FLD DRIVER
ND420 FLUORESCENT INDICATOR TUBE
IC180 MODE CONTROL
IC183 POWER FAIL DET
RESET PULSE GEN
IC182 EEPROM
IC400 REMOTE CONTROL RECEIVER
S411 POWER SAVE
S400 POWER
S410 COMMAND MODE
S401,402,404 S406,408 FUNCTION KEY
E850/E880 MODEL
SW-300 BOARD
(SEE PAGE 4-52)
F900/F990 MODEL
SW BLOCK
S001-008 S010-013 FUNCTION KEY
S451,453,457-459 FUNCTION KEY
DMS BLOCK SHUTTLE SWITCH
IC450 LED DRIVER
DM-73 BOARD
(SEE PAGE 4-28)
ML-15 BOARD
(SEE PAGE 4-45)
IC902 X-μ CON
IC901 ASIC
IC900
IC950 TXT
IC951 ROM
AT-24 BOARD (LARGE)
(SEE PAGE 4-49)
AT-23 BOARD (SMALL)
(FRONT) MOD.
(INNER) MOD.
F900/F990 MODEL

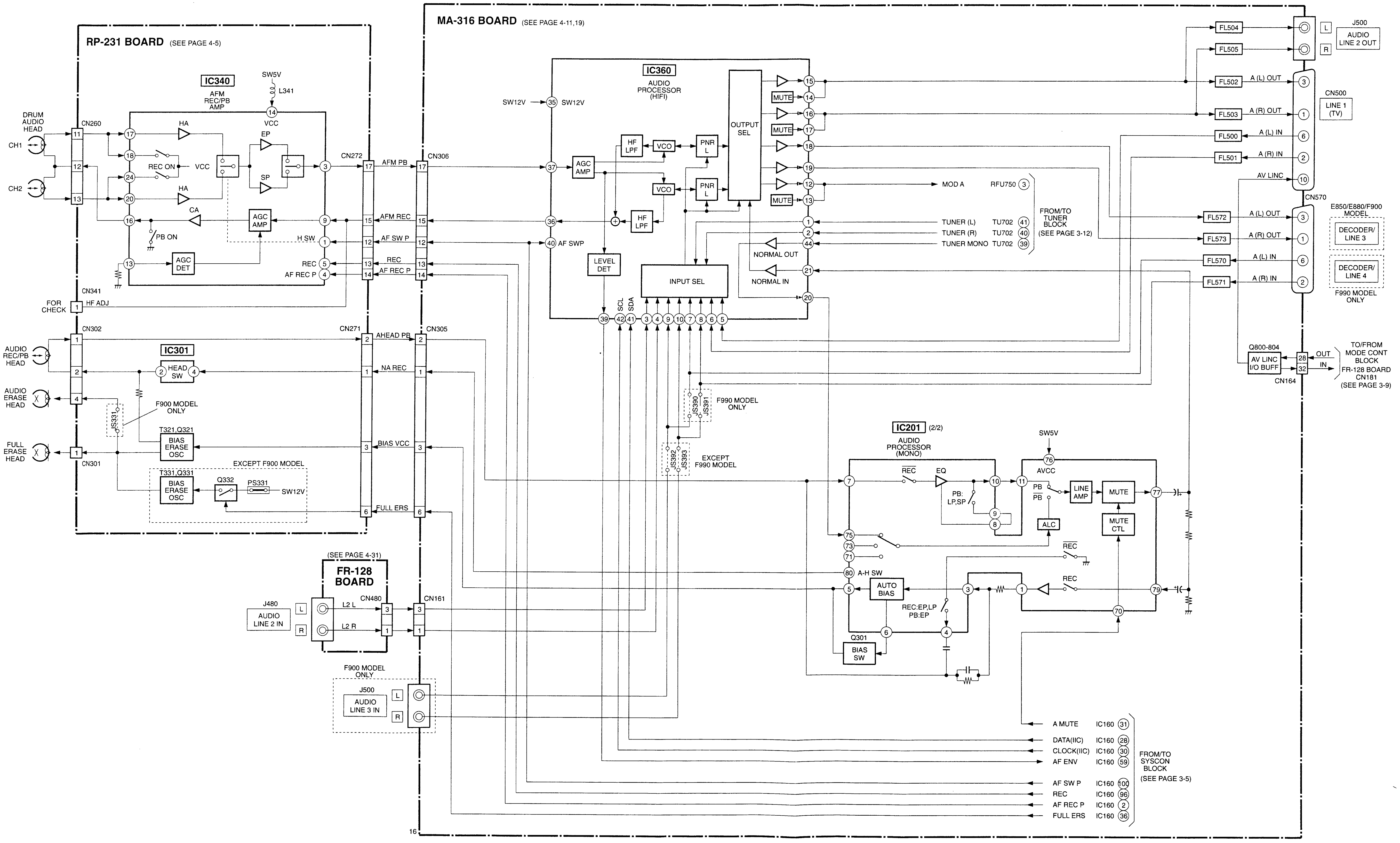
3-2. VIDEO BLOCK DIAGRAM


MA-316 BOARD (SEE PAGE 4-11,17,23)
J500 VIDEO LINE3
Q503 BUFFER
E880/F990 MODEL
F990 MODEL
FR-128 BOARD (SEE PAGE 4-31)
(FRONT) J480 VIDEO LINE2 IN
CN480 L2 V
CN161
FROM/TO TUNER BLOCK
TU702 TU V
RFU750 MOD V
JS544 EXCEPT F990 MODEL
IC540 C+ VIDEO/ I/O SEL
CLP
SW1 6dB
SW2 6dB
SW3 6dB
-6dB
SDA
SCL
Q510 BUFFER
Q540
E850/E880/F900 MODEL
CN570
V IN
V OUT
C+ DET
DECODER/ LINE 3
DECODER/ LINE 4
F990 MODEL
CN500
LINE 1 (TV)
AV CONT
IC820 FOLLOW TV PROCESSOR
Q820,821 BUFFER
FOLLOW TV IC160 (57)
C+ DET IC160 (17)
AV CONT IC160 (18)
FROM/TO SYSCON BLOCK (SEE PAGE 3-6)
Q501,502 AV CONT.
IC201 (1/2) Y/C PROCESSOR
Y/C 1
Y/C 2
Y/C 3
VIDEO AGC
SYNC SEP
Y/C MIX
QH/QV INS
VIDEO AMP
IC201 (33) REC
IC201 (38) REC
IC201 (37) REC/PB
IC202 (1/2)
SEP
Y NR
1H DL
Q209 BUFFER
CLK
JS201 EXCEPT E880 MODEL
Q664 BUFFER
X660 17.73MHz
IC660 OSD
IC661 AFC
Q662 BUFFER
Q660,661 SECAM MIX
Q663
QVD IC160 (4)
SECAM MIX IC160 (71)
PW CONT 1 CN621 (21) CN600 (11)
H DET CN164 (10)
CG V CN164 (30)
OSD S CN164 (26)
OSD SCLK Q613
OSD CS CN164 (18)
FROM/TO SYSCON BLOCK (SEE PAGE 3-6)
C ROT
IC201 (66) REC
IC201 (15) PB
ACC AMP
MAIN CONV.
C LPF
SEQ
KIL
PB EQ
PB Y/C
Q1352 BUFFER
TRAP
FM AGC
DEM
BPF
DL EQ
IC202 (2/2)
1H DL
Q210 BUFFER
Q208 DE EMPH.
CLP
FSC BPF
EXCEPT E880 MODEL
SERIAL DECODER
SW5V
L206
VXO1
VXO2
X201
Q211 BUFFER
DATA(IIC) IC160 (28)
CLOCK(IIC) IC160 (30)
IC201 (45) PB
IC201 (60) REC/PB
IC201 (20) REC
IC201 (18) REC
REC RF
REC EQ
FM MOD
DE EMPH.
C TRAP
ACK OUT
SECAM DET
NT JUGE IC160 (13)
MESECAM IC160 (14)
MEDIA VIDEO CN166 (17)
F900/F990 MODEL
FROM SYSCON BLOCK (SEE PAGE 3-6)
RP-231 BOARD (SEE PAGE 4-5)
DRUM VIDEO HEAD
SP CH1
SP CH2
EP CH1
EP CH2
CN260
IC260 VIDEO REC/PB AMP
SW7 SW3 SW8 SW4 SW10 SW6 SW9 SW5
HPF
ENV DET
COMP
LOGIC
RF SWP
DATA
CLOCK
C SYNC
C ROT
PB RF
REC RF
REC IDEL
VCA
Q260 BUFFER
L263 L262
CN272 CN306 CN271 CN305
IC260 (4) REC
CN261
CHECK PIN
PB RF
RF SWP
AV ADJ
CN261 (1) PB
IC260 (4) REC
CN261 (2) REC/PB
25Hz
5Vp-p
IC160 (56) AV ADJ
IC160 (66) C SYNC
IC160 (81) CLOCK (SSB)
IC160 (80) DATA (SSB)
IC160 (1) RF SWP
IC160 (60) RF ENV
FROM/TO SYSCON BLOCK (SEE PAGE 3-6)
CN164 (13) SDA
CN164 (14) SCL
CN164 (31) PDC DAV
IC850 VPS/PDC DECODER
D5V
VDDA
VDDD
CVBS
DAVN
Q850 BUFFER
Q201 BUFFER
CN307
REC C
PB RF
C SYNC
SE-69 BOARD (SEE PAGE 4-33)
CN970
Q972
Q974 BUFFER
2.2M TRAP
REC MUTE
1.1M BELL
1.1M BPF
SYNC GATE
1/4
LIM
4.3M A BELL
4.3M BPF
1.1M A BELL
X2
2.2M BPF
LPF
AGC AMP
CTL
SYNC GATE
SECAM DET
4.3M BELL
PB MUTE
Q1352 2.2M TRAP
Q973 BUFFER
Q970 4.3M BELL
Q975,976 SWITCH
IC970 SECAM PROCESSOR
SECAM ON
FSC
SECAM VIDEO
PB C
PB 3V
SECAM DET
SECAM ON IC160 (26)
SECAM DET IC160 (12)
DNR RESET IC160 (79)
French MODEL
NR-26 BOARD (SEE PAGE 4-41)
IC003 DNR PROC.
Q009 Y L.P.E
Q010 BUFFER
CN001
Q008 BUFFER
FL001 L.P.F
Q002 AMP
Q011 BUFFER
FL002 L.P.F
Q007 AMP
Q004,005 Y/C MIX
Q001,003 Y/C MIX
IC002 VIDEO SW
EE SIG
THRU SIG
ON SIG
ON/OFF
EE/PB
Q012,013 C L.P.E
Q006 BUFFER
DNR V IN
DNR V OUT
PB C
FSC
C SYNC
DATA(IIC)
CLOCK(IIC)
DNR RESET
CN308
EXCEPT French MODEL

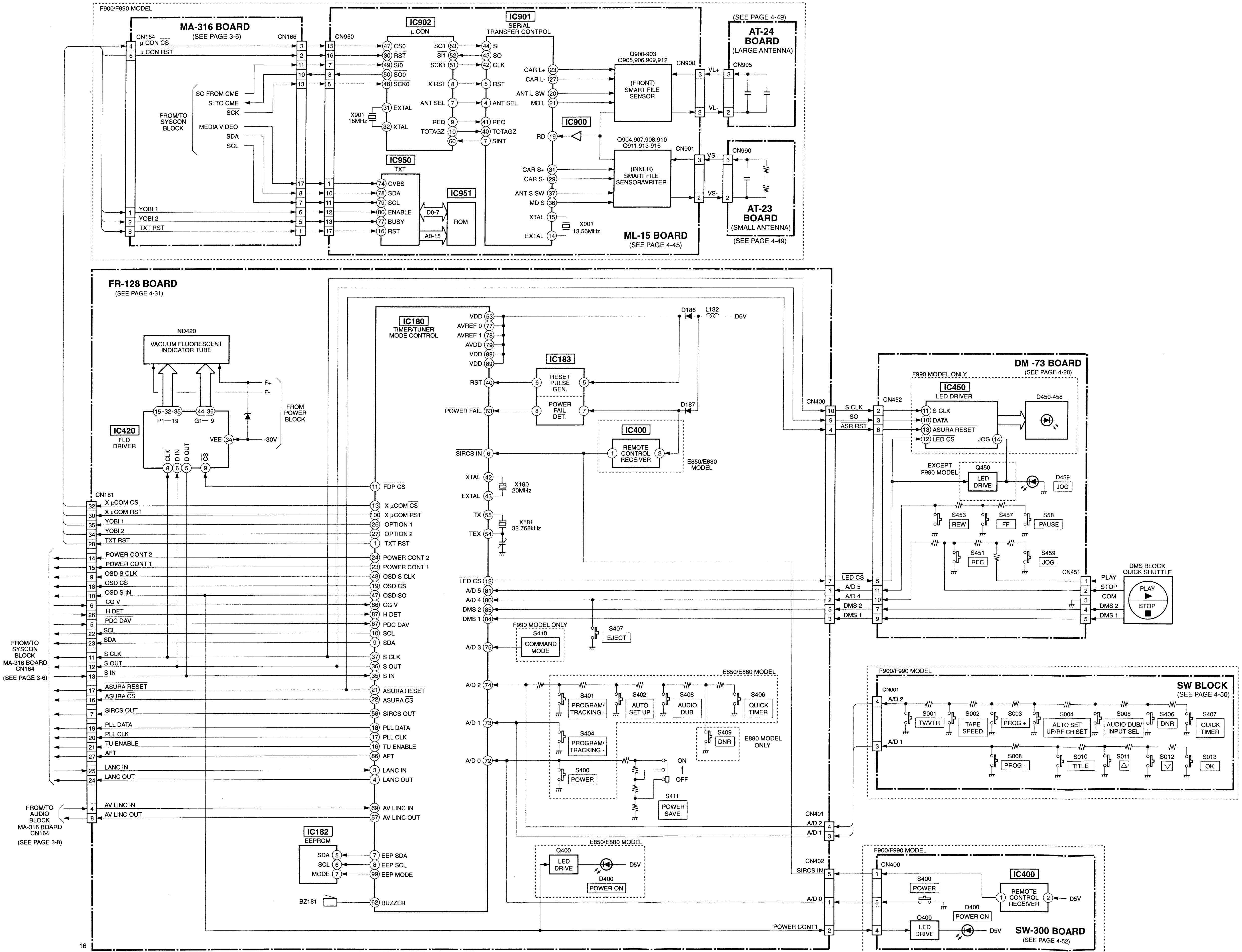
3-3. SERVO/SYSTEM CONTROL BLOCK DIAGRAM


MA-316 BOARD
(SEE PAGE 4-14)
DRUM MOTOR
M901
VCC
OUTPUT
OUTPUT
HALL DEVICE
MATRIX
PG
FG
M12V
D132
CN101
D VS
D PG
D FG
IC100 (1/2)
DRUM ERR INTEG
REF 2.5V
IC160 (1/2)
SERVO CONTROL
74 DRUM DA
68 DRUM PG
69 DRUM FG
CN101 ③ REC/PB
25Hz
5Vp-p
CN101 ④ REC/PB
300Hz
CAPSTAN MOTOR
M902
SW5V
HALL DEVICE
U+
U-
V+
V-
W+
W-
VM
VCC
TL
U
V
W
CAPSTAN FG
M12V
SW5V
PS130
CN102
LIMITER
D107
IC100 (2/2)
CAP ERR INTEG
REF 2.5V
CVS
CAP RVS
CAP FG
84 CAP TRQ PWM
99 STEP PLS
35 CAP STOP
73 CAP DA
72 CAP RVS
70 CAP FG
IC160 ⑳ REC/PB
1.515kHz
4Vp-p
CN271
CN305
CN302
IC140
CTL AMP
CTL HEAD
CN261
CTL
FOR CHECK
RP-231 BOARD
(SEE PAGE 4-5)
IC141
CTL REC/PB AMP
Q141
GAIN SW
7 REC CTL
67 PB CTL
92 CTL GAIN
8 HYS HIGH
CN104
LOADING MOTOR
S100
CAM ENCODER
(MECHA POSITION)
MODE1
MODE2
MODE3
MODE4
EXCEPT E880/F900 MODEL
J890
SIRCS
Q891-893
SIRCS CBC I/O
IC161
LOADING MOTOR DRIVE
M12V
D131
8 VCC1
9 VCC2
2 CAM+
10 CAM-
IN1 3
IN2 4
IC160 ⑮ REC/PB
25Hz
5Vp-p
IC160 (2/2)
SYSTEM CONTROL
D6V
D160
L161
53 AVREF
54 AVDD
89 VDD
90 5V
IC360 41 DATA(IIC)
IC360 42 CLOCK(IIC)
IC360 39 AF ENV
CN306 12, IC360 40 AF SWP
CN306 13 REC
CN306 14 AF REC P
CN305 6 FULL ERS
IC201 70 A MUTE
FROM/TO AUDIO BLOCK (SEE PAGE3-8)
59 AF ENV
100 AF SWP
96 REC
2 AF REC P
36 FULL ERS
31 A MUTE
SW12V
PH100 T REEL FG
PH101 S REEL FG
64 T REEL FG
63 S REEL FG
61 T SENS
62 S SENS
D6V
D102 T/S LED
Q101 TAKE END SENSOR
Q100 SUPPLY END SENSOR
Q102 LED DRIVE
32 T/E LED
S101 REC PROOF
15 REC PRF
S160 NTSC PB SW
55 NT PB SW
9 CAM2
22 MODE1
21 MODE2
20 MODE3
19 MODE4
IC160 ④ REC/PB
16MHz
4.5Vp-p
X160 16MHz
42 XTAL
43 EXTAL
IC160 ① REC/PB
25Hz
5Vp-p
SDA 0 28
SCL 0 30
FOLLOW TV 57
C+ DET 17
AV CONT 16
AV ADJ 56
C SYNC 66
CLOCK(SSB) 81
DATA(SSB) 80
RF SWP 1
RF ENV 60
Q VD 4
SECAM MIX 71
NT JUGE 13
MESECAM 14
SECAM ON 26
SECAM DET 12
DNR RESET 79
POWER SAVE CONT 23
S CLK 47
S IN 0 45
S OUT 0 46
ASURA RESET 40
ASURA CS 44
AUTO PRESET 5
SW1 18
SW2 51
MOD CONT 25
DATA(IIC) IC201 64, CN308 3
CLOCK(IIC) IC201 63, CN308 2
FOLLOW TV Q820,821
C+ DET CN570 8
AV CONT Q501,502
AV ADJ CN306 8
C SYNC IC201 37, CN306 3, CN307 7, CN308 7
CLOCK(SSB) CN306 4
DATA(SSB) CN306 5
RF SWP CN306 6
RF ENV CN306 7
SDA IC540 9, IC350 5
SCL IC540 11, IC850 4
PDC DAV IC850 9
Q VD IC201 33
SECAM MIX Q660,661
PW CONT1 Q663 33
H DET IC661 8
CG V IC660 11
OSD S IC660 23
OSD SCLK IC660 22
OSD CS IC660 24
NT JUGE IC201 62
MESECAM IC201 65
MEDIA VIDEO IC201 34
SECAM ON CN307 3
SECAM DET CN307 1
DNR RESET CN309 1
FROM/TO VIDEO BLOCK (SEE PAGE 3-3,4)
CN600
POWER SAVE CONT 17
POWER CONT1 11
POWER CONT2 13
TO POWER BLOCK
Q613
CN164
POWER CONT2 22
POWER CONT1 21
OSD SCLK 27
OSD CS 18
OSD S IN 26
CG V 30
H DET 10
PDC DAV 31
SCL 14
SDA 13
S CLK 25
S OUT 24
S IN 23
ASURA RESET 19
ASURA CS 20
SIRCS OUT 29
PLL DATA 17
PLL CLOCK 16
TU ENABLE 15
TU AFT 9
LANC IN 9
LANC OUT 10
TO/FROM MODE CONTROL BLOCK FR-128 BOARD CN181 (SEE PAGE 3-9)
CN165
D6V
FOR CHECK
TU AFT TU702 24
TU ENABLE TU702 15
PLL CLOCK TU702 13
PLL DATA TU702 14
SDA TU702 34, RFU750 7
SCL TY702 33, RFU750 6
AUTO PRESET Q703
SW1 TU702 35
SW2 TU702 36
MODE CONT Q751,752
TO TUNER BLOCK
MEDIA VIDEO CN166 17
SCL CN166 7
SDA CN166 8
SCK CN166 13
SO CN166 11
SI CN166 10
TO/FROM MODE CONTROL BLOCK (SEE PAGE 3-9)
16

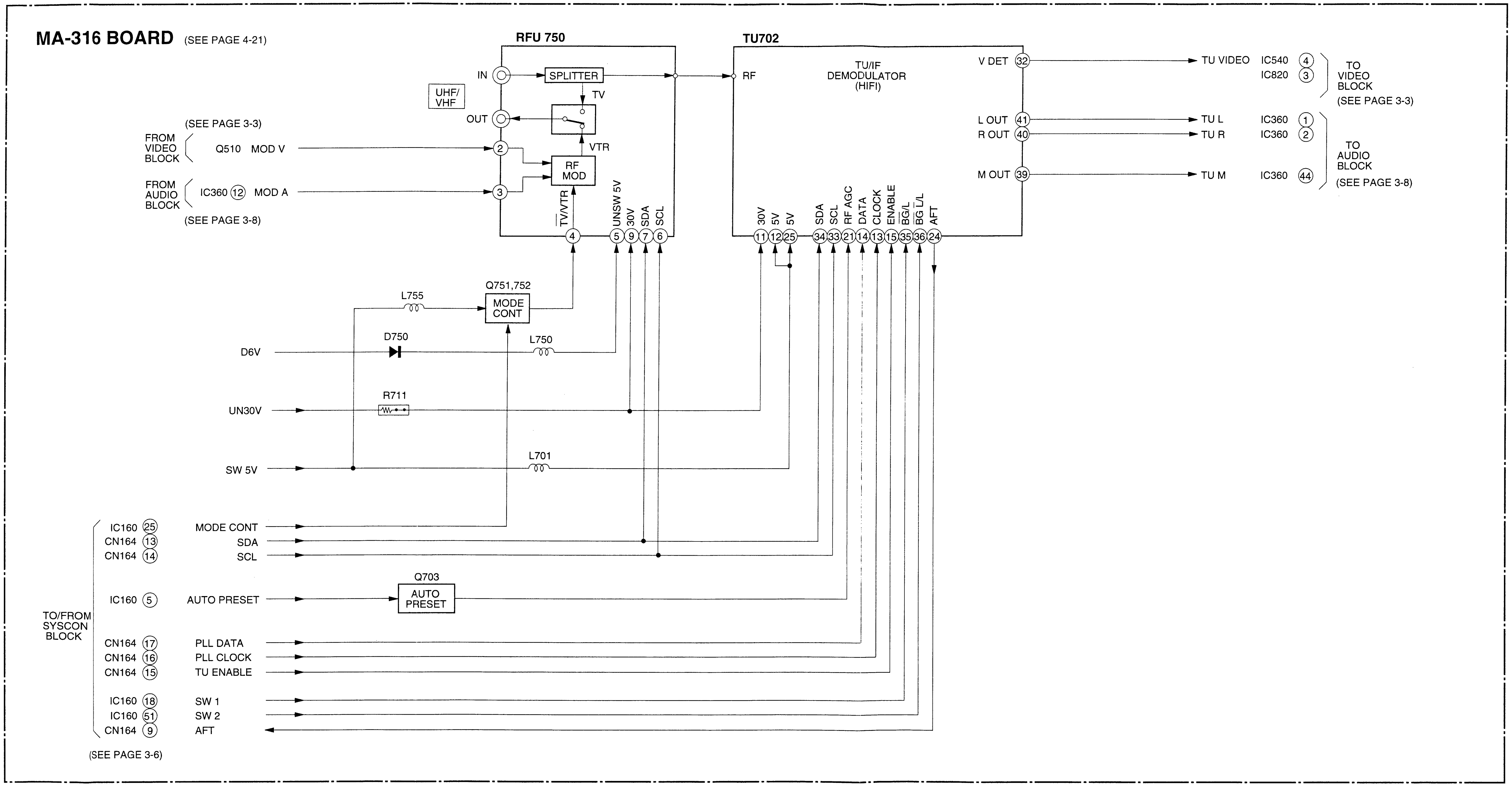
3-4. AUDIO BLOCK DIAGRAM


RP-231 BOARD (SEE PAGE 4-5)
MA-316 BOARD (SEE PAGE 4-11,19)
IC340
AFM REC/PB AMP
SW5V
L341
VCC
HA
EP
SP
CA
REC ON
PB ON
AGC AMP
AGC DET
H SW
REC
AF REC P
DRUM AUDIO HEAD
CH1
CH2
CN260
CN272
AFM PB
AFM REC
AF SW P
AF REC P
CN306
CN341
FOR CHECK
HF ADJ
CN302
AUDIO REC/PB HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
CN301
IC301
HEAD SW
JS331
F900 MODEL ONLY
T321,Q321
BIAS ERASE OSC
EXCEPT F900 MODEL
T331,Q331
Q332
PS331
SW12V
CN271
AHEAD PB
NA REC
BIAS VCC
FULL ERS
CN305
IC360
AUDIO PROCESSOR (HIFI)
SW12V
AGC AMP
HF LPF
VCO
PNR L
OUTPUT SEL
MUTE
LEVEL DET
INPUT SEL
AF SWP
SCL
SDA
NORMAL OUT
NORMAL IN
MOD A
RFU750
TUNER (L)
TUNER (R)
TUNER MONO
TU702
FROM/TO TUNER BLOCK (SEE PAGE 3-12)
FL504
FL505
FL502
FL503
FL500
FL501
A (L) OUT
A (R) OUT
A (L) IN
A (R) IN
AV LINC
J500
AUDIO LINE 2 OUT
CN500
LINE 1 (TV)
CN570
FL572
FL573
FL570
FL571
E850/E880/F900 MODEL
DECODER/ LINE 3
DECODER/ LINE 4
F990 MODEL ONLY
Q800-804
AV LINC I/O BUFF
CN164
OUT
IN
TO/FROM MODE CONT BLOCK FR-128 BOARD CN181 (SEE PAGE 3-9)
JS390
JS391
F990 MODEL ONLY
JS392
JS393
EXCEPT F990 MODEL
IC201 (2/2)
AUDIO PROCESSOR (MONO)
REC
EQ
PB: LP,SP
AVCC
SW5V
PB
LINE AMP
MUTE
MUTE CTL
ALC
A-H SW
AUTO BIAS
REC:EP,LP PB:EP
Q301
BIAS SW
(SEE PAGE 4-31)
FR-128 BOARD
J480
AUDIO LINE 2 IN
CN480
L2 L
L2 R
CN161
F900 MODEL ONLY
J500
AUDIO LINE 3 IN
A MUTE IC160 ㉛
DATA(IIC) IC160 ㉘
CLOCK(IIC) IC160 ㉚
AF ENV IC160 (59)
AF SW P IC160 (100)
REC IC160 (96)
AF REC P IC160 ②
FULL ERS IC160 (36)
FROM/TO SYSCON BLOCK (SEE PAGE 3-5)
16

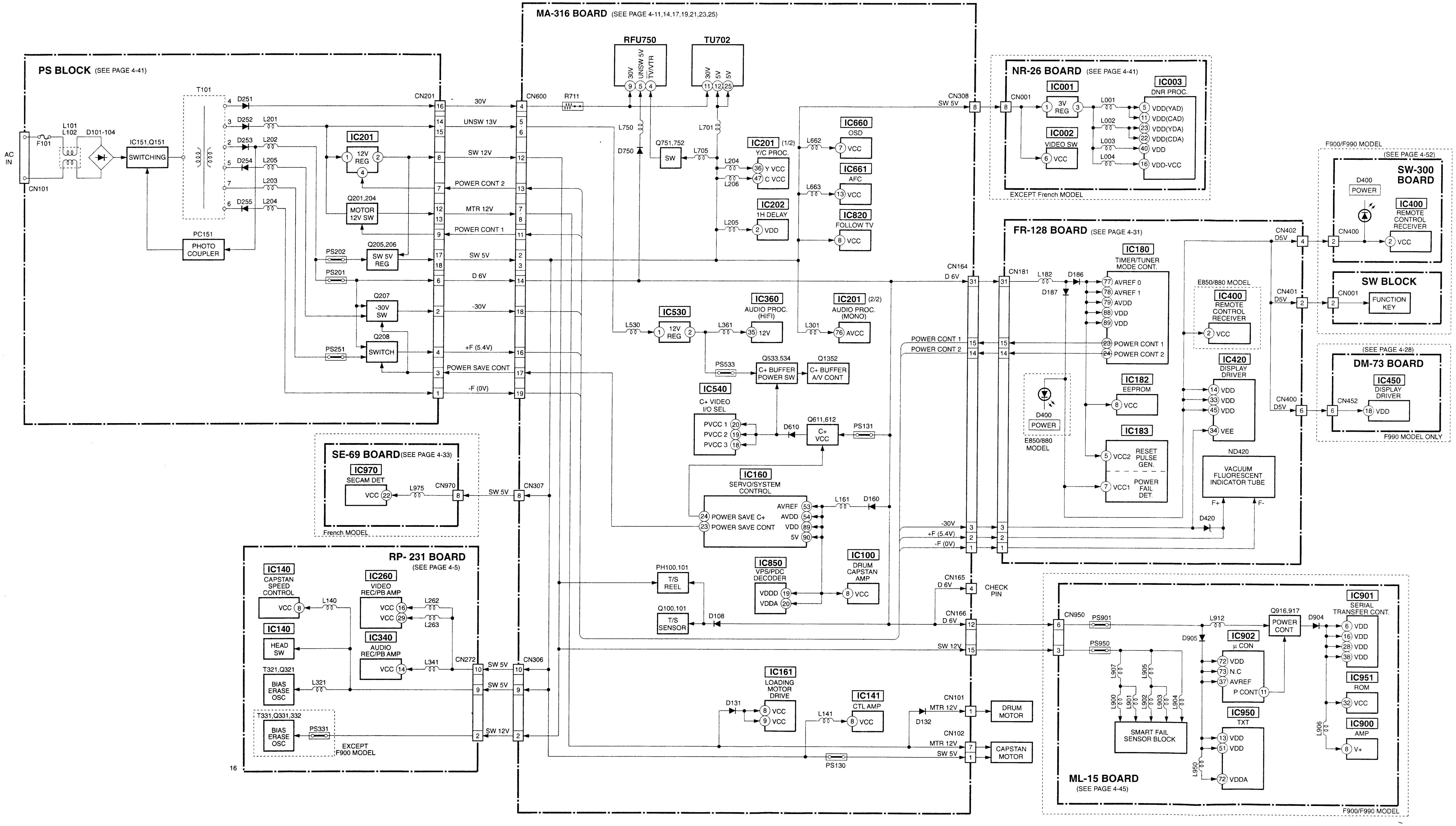
3-5. MODE CONTROL BLOCK DIAGRAM


F900/F990 MODEL
MA-316 BOARD
(SEE PAGE 3-6)
CN164
μ CON CS
μ CON RST
CN166
SO FROM CME
SI TO CME
SCK
FROM/TO SYSCON BLOCK
MEDIA VIDEO
SDA
SCL
YOBI 1
YOBI 2
TXT RST
CN950
IC902
μ CON
CS0
RST
SI0
SO0
SCK0
EXTAL
XTAL
X901 16MHz
SO1
SI1
SCK1
X RST
ANT SEL
REQ
TOTAGZ
IC901
SERIAL TRANSFER CONTROL
SI
SO
CLK
RST
ANT SEL
REQ
TOTAGZ
SINT
IC950
TXT
CVBS
SDA
SCL
ENABLE
BUSY
RST
D0-7
A0-15
IC951
ROM
CAR L+
CAR L-
ANT L SW
MD L
IC900
RD
CAR S+
CAR S-
ANT S SW
MD S
XTAL
EXTAL
X001 13.56MHz
Q900-903 Q905,906,909,912
(FRONT) SMART FILE SENSOR
Q904,907,908,910 Q911,913-915
(INNER) SMART FILE SENSOR/WRITER
CN900
CN901
VL+
VL-
VS+
VS-
ML-15 BOARD
(SEE PAGE 4-45)
(SEE PAGE 4-49)
AT-24 BOARD
(LARGE ANTENNA)
CN995
AT-23 BOARD
(SMALL ANTENNA)
CN990
(SEE PAGE 4-49)
FR-128 BOARD
(SEE PAGE 4-31)
ND420
VACUUM FLUORESCENT INDICATOR TUBE
F+
F-
FROM POWER BLOCK
-30V
P1—19
G1—9
IC420
FLD DRIVER
VEE
CLK
D IN
D OUT
CS
CN181
X μCOM CS
X μCOM RST
YOBI 1
YOBI 2
TXT RST
POWER CONT 2
POWER CONT 1
OSD S CLK
OSD CS
OSD S IN
CG V
H DET
PDC DAV
SCL
SDA
S CLK
S OUT
S IN
ASURA RESET
ASURA CS
SIRCS OUT
PLL DATA
PLL CLK
TU ENABLE
AFT
LANC IN
LANC OUT
AV LINC IN
AV LINC OUT
FROM/TO SYSCON BLOCK MA-316 BOARD CN164 (SEE PAGE 3-6)
FROM/TO AUDIO BLOCK MA-316 BOARD CN164 (SEE PAGE 3-8)
IC180
TIMER/TUNER MODE CONTROL
FDP CS
OPTION 1
OPTION 2
OSD SO
EEP SDA
EEP SCL
EEP MODE
BUZZER
VDD
AVREF 0
AVREF 1
AVDD
RST
POWER FAIL
SIRCS IN
XTAL
X180 20MHz
EXTAL
TX
TEX
X181 32.768kHz
LED CS
A/D 5
A/D 4
DMS 2
DMS 1
A/D 3
A/D 2
A/D 1
A/D 0
IC182
EEPROM
SDA
SCL
MODE
BZ181
IC183
RESET PULSE GEN.
POWER FAIL DET.
D186
L182
D6V
D187
IC400
REMOTE CONTROL RECEIVER
E850/E880 MODEL
F990 MODEL ONLY
S410
COMMAND MODE
S407
EJECT
E850/E880 MODEL
S401
PROGRAM/ TRACKING+
S402
AUTO SET UP
S408
AUDIO DUB
S406
QUICK TIMER
S404
PROGRAM/ TRACKING -
S409
DNR
E880 MODEL ONLY
S400
POWER
ON
OFF
S411
POWER SAVE
E850/E880 MODEL
Q400
LED DRIVE
D400
POWER ON
D5V
CN400
CN401
CN402
SIRCS IN
POWER CONT1
16
DM -73 BOARD
(SEE PAGE 4-26)
F990 MODEL ONLY
CN452
IC450
LED DRIVER
S CLK
DATA
ASURA RESET
LED CS
JOG
D450-458
SO
ASR RST
EXCEPT F990 MODEL
Q450
LED DRIVE
D459
JOG
S453
REW
S457
FF
S58
PAUSE
S451
REC
S459
JOG
CN451
DMS BLOCK QUICK SHUTTLE
PLAY
STOP
COM
DMS 2
DMS 1
F900/F990 MODEL
SW BLOCK
(SEE PAGE 4-50)
CN001
S001
TV/VTR
S002
TAPE SPEED
S003
PROG +
S004
AUTO SET UP/RF CH SET
S005
AUDIO DUB/ INPUT SEL
S406
DNR
S407
QUICK TIMER
S008
PROG -
S010
TITLE
S011
△
S012
▽
S013
OK
F900/F990 MODEL
CN400
S400
POWER
D400
POWER ON
Q400
LED DRIVE
IC400
REMOTE CONTROL RECEIVER
SW-300 BOARD
(SEE PAGE 4-52)

3-6. TUNER BLOCK DIAGRAM

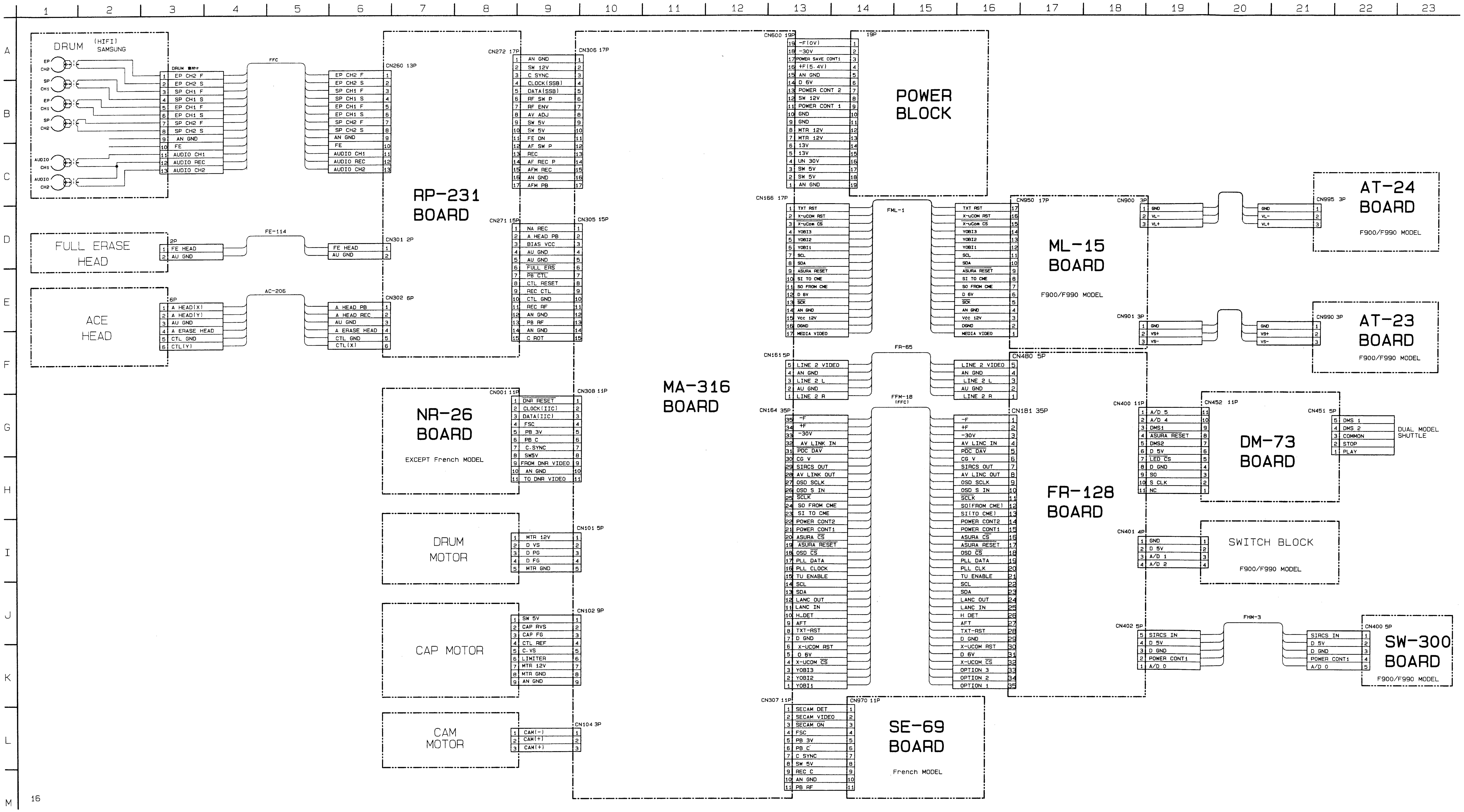

MA-316 BOARD (SEE PAGE 4-21)
RFU 750
IN
SPLITTER
UHF/ VHF
TV
OUT
VTR
RF MOD
TV/VTR
UNSW 5V
30V
SDA
SCL
(SEE PAGE 3-3)
FROM VIDEO BLOCK
Q510 MOD V
FROM AUDIO BLOCK
IC360 ⑫ MOD A
(SEE PAGE 3-8)
TU702
RF
TU/IF DEMODULATOR (HIFI)
V DET ㉜
L OUT ㊶
R OUT ㊵
M OUT ㊴
30V
5V
5V
SDA
SCL
RF AGC
DATA
CLOCK
ENABLE
BG/L
BG L/L
AFT
TU VIDEO IC540 ④
IC820 ③
TO VIDEO BLOCK (SEE PAGE 3-3)
TU L IC360 ①
TU R IC360 ②
TU M IC360 ㊹
TO AUDIO BLOCK (SEE PAGE 3-8)
Q751,752
L755
MODE CONT
D750
L750
D6V
R711
UN30V
L701
SW 5V
IC160 ㉕ MODE CONT
CN164 ⑬ SDA
CN164 ⑭ SCL
Q703
IC160 ⑤ AUTO PRESET
AUTO PRESET
TO/FROM SYSCON BLOCK
CN164 ⑰ PLL DATA
CN164 ⑯ PLL CLOCK
CN164 ⑮ TU ENABLE
IC160 ⑱ SW 1
IC160 (51) SW 2
CN164 ⑨ AFT
(SEE PAGE 3-6)

3-7. POWER SUPPLY BLOCK DIAGRAM


PS BLOCK (SEE PAGE 4-41)
AC IN
CN101
F101
L101
L102
D101-104
IC151,Q151
SWITCHING
T101
D251
D252
D253
D254
D255
L201
L202
L205
L203
L204
PC151
PHOTO COUPLER
IC201
12V REG
Q201,204
MOTOR 12V SW
PS202
PS201
Q205,206
SW 5V REG
Q207
-30V SW
Q208
SWITCH
PS251
CN201
30V
UNSW 13V
SW 12V
POWER CONT 2
MTR 12V
POWER CONT 1
SW 5V
D 6V
-30V
+F (5.4V)
POWER SAVE CONT
-F (0V)
MA-316 BOARD (SEE PAGE 4-11,14,17,19,21,23,25)
CN600
R711
RFU750
30V
UNSW 5V
TV/VTR
TU702
30V
5V
5V
L750
D750
Q751,752
SW
L701
L705
IC201 (1/2)
Y/C PROC.
Y VCC
C VCC
L204
L206
IC202
1H DELAY
VDD
L205
L662
IC660
OSD
VCC
IC661
AFC
L663
VCC
IC820
FOLLOW TV
VCC
CN308
SW 5V
IC530
12V REG
L530
L361
IC360
AUDIO PROC. (HIFI)
12V
IC201 (2/2)
AUDIO PROC. (MONO)
L301
AVCC
PS533
Q533,534
C+ BUFFER POWER SW
Q1352
C+ BUFFER A/V CONT
IC540
C+ VIDEO I/O SEL
PVCC 1
PVCC 2
PVCC 3
D610
Q611,612
C+ VCC
PS131
IC160
SERVO/SYSTEM CONTROL
AVREF
AVDD
VDD
5V
POWER SAVE C+
POWER SAVE CONT
L161
D160
POWER CONT 1
POWER CONT 2
CN164
D 6V
-30V
+F (5.4V)
-F (0V)
PH100,101
T/S REEL
Q100,101
T/S SENSOR
D108
IC850
VPS/PDC DECODER
VDDD
VDDA
IC100
DRUM CAPSTAN AMP
VCC
CN165
D 6V
CHECK PIN
CN166
D 6V
SW 12V
IC161
LOADING MOTOR DRIVE
D131
VCC
VCC
IC141
CTL AMP
L141
VCC
D132
CN101
MTR 12V
DRUM MOTOR
CN102
MTR 12V
SW 5V
CAPSTAN MOTOR
PS130
CN307
CN306
SE-69 BOARD (SEE PAGE 4-33)
IC970
SECAM DET
VCC
L975
CN970
SW 5V
French MODEL
RP- 231 BOARD (SEE PAGE 4-5)
IC140
CAPSTAN SPEED CONTROL
VCC
L140
IC260
VIDEO REC/PB AMP
VCC
VCC
L262
L263
IC140
HEAD SW
IC340
AUDIO REC/PB AMP
VCC
L341
CN272
T321,Q321
BIAS ERASE OSC
L321
T331,Q331,332
BIAS ERASE OSC
PS331
EXCEPT F900 MODEL
SW 5V
SW 5V
SW 12V
16
NR-26 BOARD (SEE PAGE 4-41)
CN001
IC001
3V REG
L001
L002
L003
L004
IC003
DNR PROC.
VDD(YAD)
VDD(CAD)
VDD(YDA)
VDD(CDA)
VDD
VDD-VCC
IC002
VIDEO SW
VCC
EXCEPT French MODEL
FR-128 BOARD (SEE PAGE 4-31)
CN181
L182
D186
D187
IC180
TIMER/TUNER MODE CONT.
AVREF 0
AVREF 1
AVDD
VDD
VDD
POWER CONT 1
POWER CONT 2
D400
POWER
E850/880 MODEL
IC182
EEPROM
VCC
IC183
RESET PULSE GEN.
VCC2
VCC1
POWER FAIL DET.
E850/880 MODEL
IC400
REMOTE CONTROL RECEIVER
VCC
IC420
DISPLAY DRIVER
VDD
VDD
VDD
VEE
ND420
VACUUM FLUORESCENT INDICATOR TUBE
F+
F-
D420
CN402
D5V
CN401
D5V
CN400
D5V
F900/F990 MODEL
(SEE PAGE 4-52)
SW-300 BOARD
D400
POWER
CN400
IC400
REMOTE CONTROL RECEIVER
VCC
SW BLOCK
CN001
FUNCTION KEY
(SEE PAGE 4-28)
DM-73 BOARD
CN452
IC450
DISPLAY DRIVER
VDD
F990 MODEL ONLY
ML-15 BOARD (SEE PAGE 4-45)
CN950
PS901
PS950
L912
Q916,917
POWER CONT
D904
D905
IC902
µ CON
VDD
N.C
AVREF
P CONT
L907
L905
L900
L901
L902
L903
L904
SMART FAIL SENSOR BLOCK
IC950
TXT
VDD
VDD
VDDA
L950
IC901
SERIAL TRANSFER CONT.
VDD
VDD
VDD
VDD
IC951
ROM
VCC
L906
IC900
AMP
V+
F900/F990 MODEL

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM

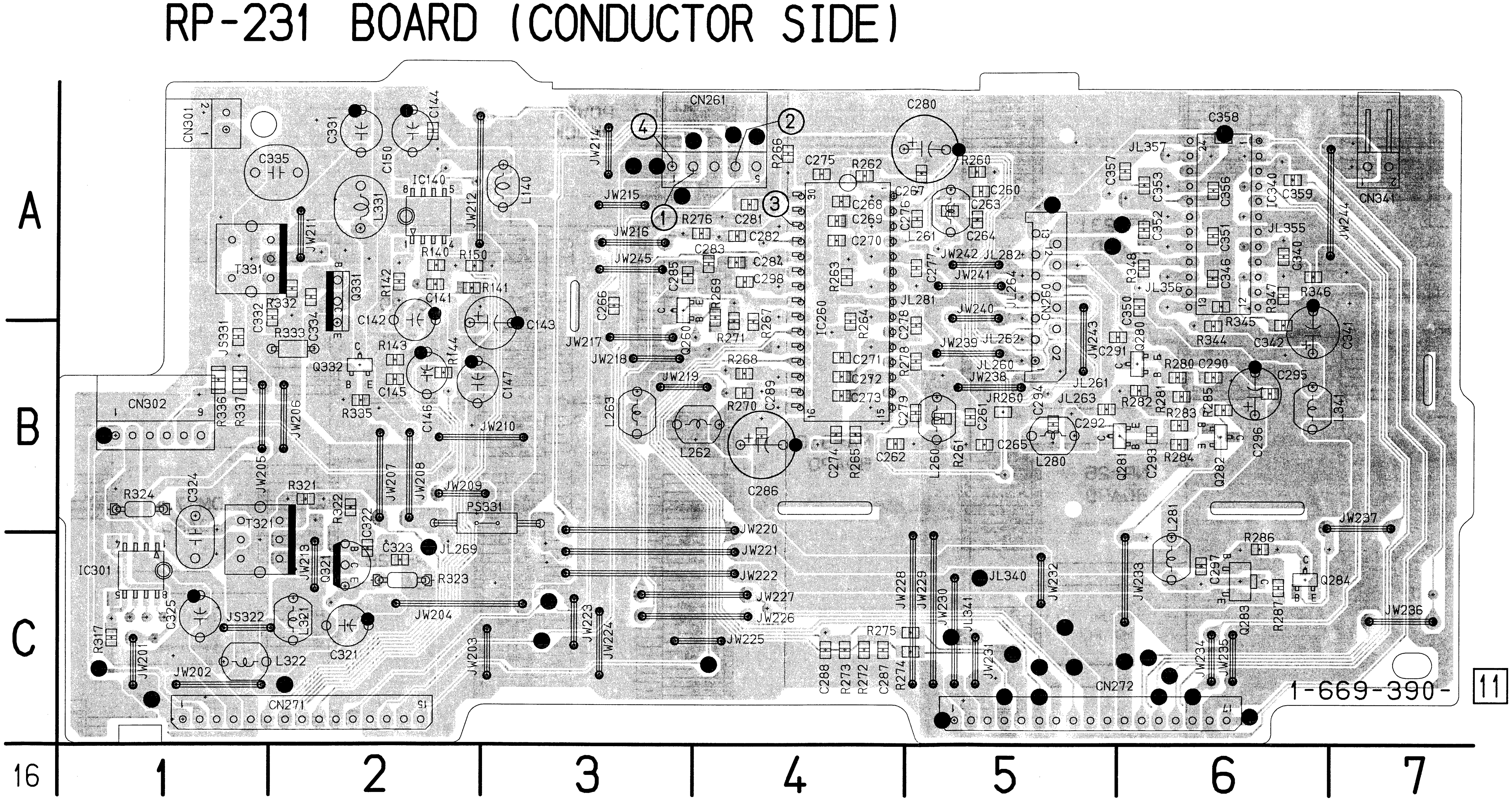

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
A B C D E F G H I J K L M
DRUM (HIFI) SAMSUNG
EP CH2
SP CH1
EP CH1
SP CH2
AUDIO CH1
AUDIO CH2
1 EP CH2 F
2 EP CH2 S
3 SP CH1 F
4 SP CH1 S
5 EP CH1 F
6 EP CH1 S
7 SP CH2 F
8 SP CH2 S
9 AN GND
10 FE
11 AUDIO CH1
12 AUDIO REC
13 AUDIO CH2
FFC
CN260 13P
FULL ERASE HEAD
2P
1 FE HEAD
2 AU GND
FE-114
CN301 2P
ACE HEAD
6P
1 A HEAD(X)
2 A HEAD(Y)
3 AU GND
4 A ERASE HEAD
5 CTL GND
6 CTL(Y)
AC-206
CN302 6P
1 A HEAD PB
2 A HEAD REC
3 AU GND
4 A ERASE HEAD
5 CTL GND
6 CTL(X)
RP-231 BOARD
CN272 17P
CN306 17P
1 AN GND
2 SW 12V
3 C SYNC
4 CLOCK(SSB)
5 DATA(SSB)
6 RF SW P
7 RF ENV
8 AV ADJ
9 SW 5V
10 SW 5V
11 FE ON
12 AF SW P
13 REC
14 AF REC P
15 AFM REC
16 AN GND
17 AFM PB
CN271 15P
CN305 15P
1 NA REC
2 A HEAD PB
3 BIAS VCC
4 AU GND
5 AU GND
6 FULL ERS
7 PB CTL
8 CTL RESET
9 REC CTL
10 CTL GND
11 REC RF
12 AN GND
13 PB RF
14 AN GND
15 C ROT
NR-26 BOARD
EXCEPT French MODEL
CN001 11P
CN308 11P
1 DNR RESET
2 CLOCK(IIC)
3 DATA(IIC)
4 FSC
5 PB 3V
6 PB C
7 C.SYNC
8 SW5V
9 FROM DNR VIDEO
10 AN GND
11 TO DNR VIDEO
DRUM MOTOR
CN101 5P
1 MTR 12V
2 D VS
3 D PG
4 D FG
5 MTR GND
CAP MOTOR
CN102 9P
1 SW 5V
2 CAP RVS
3 CAP FG
4 CTL REF
5 C.VS
6 LIMITER
7 MTR 12V
8 MTR GND
9 AN GND
CAM MOTOR
CN104 3P
1 CAM(-)
2 CAM(+)
3 CAM(+)
MA-316 BOARD
CN600 19P
19P
POWER BLOCK
19 -F(0V)
18 -30V
17 POWER SAVE CONT1
16 +F(5.4V)
15 AN GND
14 D 6V
13 POWER CONT 2
12 SW 12V
11 POWER CONT 1
10 GND
9 GND
8 MTR 12V
7 MTR 12V
6 13V
5 13V
4 UN 30V
3 SW 5V
2 SW 5V
1 AN GND
CN166 17P
FML-1
CN950 17P
1 TXT RST
2 X-UCOM RST
3 X-UCOM CS
4 YOBI3
5 YOBI2
6 YOBI1
7 SCL
8 SDA
9 ASURA RESET
10 SI TO CME
11 SO FROM CME
12 D 6V
13 SCK
14 AN GND
15 Vcc 12V
16 DGND
17 MEDIA VIDEO
ML-15 BOARD
F900/F990 MODEL
CN900 3P
CN995 3P
1 GND
2 VL-
3 VL+
AT-24 BOARD
F900/F990 MODEL
CN901 3P
CN990 3P
1 GND
2 VS+
3 VS-
AT-23 BOARD
F900/F990 MODEL
CN161 5P
FR-65
CN480 5P
5 LINE 2 VIDEO
4 AN GND
3 LINE 2 L
2 AU GND
1 LINE 2 R
CN164 35P
FFM-18 (FFC)
CN181 35P
35 -F
34 +F
33 -30V
32 AV LINK IN
31 PDC DAV
30 CG V
29 SIRCS OUT
28 AV LINK OUT
27 OSD SCLK
26 OSD S IN
25 SCLK
24 SO FROM CME
23 SI TO CME
22 POWER CONT2
21 POWER CONT1
20 ASURA CS
19 ASURA RESET
18 OSD CS
17 PLL DATA
16 PLL CLOCK
15 TU ENABLE
14 SCL
13 SDA
12 LANC OUT
11 LANC IN
10 H DET
9 AFT
8 TXT-RST
7 D GND
6 X-UCOM RST
5 D 6V
4 X-UCOM CS
3 YOBI3
2 YOBI2
1 YOBI1
OPTION 3
OPTION 2
OPTION 1
FR-128 BOARD
CN400 11P
CN452 11P
1 A/D 5
2 A/D 4
3 DMS1
4 ASURA RESET
5 DMS2
6 D 5V
7 LED CS
8 D GND
9 SD
10 S CLK
11 NC
DM-73 BOARD
CN451 5P
5 DMS 1
4 DMS 2
3 COMMON
2 STOP
1 PLAY
DUAL MODEL SHUTTLE
CN401 4P
1 GND
2 D 5V
3 A/D 1
4 A/D 2
SWITCH BLOCK
F900/F990 MODEL
CN402 5P
FHM-3
CN400 5P
5 SIRCS IN
4 D 5V
3 D GND
2 POWER CONT1
1 A/D 0
SW-300 BOARD
F900/F990 MODEL
CN307 11P
CN970 11P
1 SECAM DET
2 SECAM VIDEO
3 SECAM ON
4 FSC
5 PB 3V
6 PB C
7 C SYNC
8 SW 5V
9 REC C
10 AN GND
11 PB RF
SE-69 BOARD
French MODEL
16

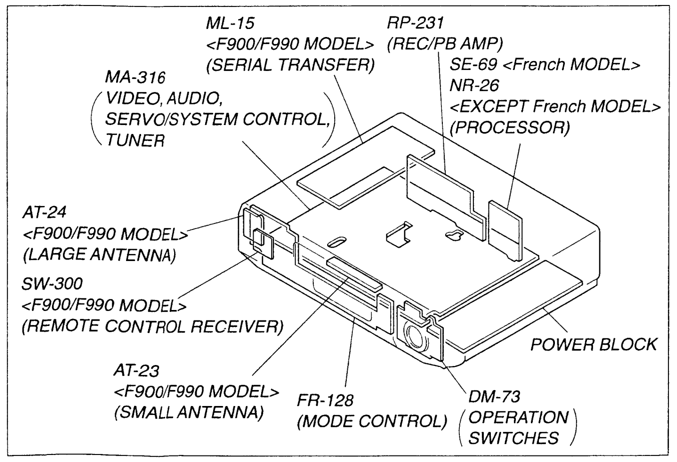
4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

RP-231 (REC/PB AMP) PRINTED WIRING BOARD

— Ref. No.: RP-231 Board; 1,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

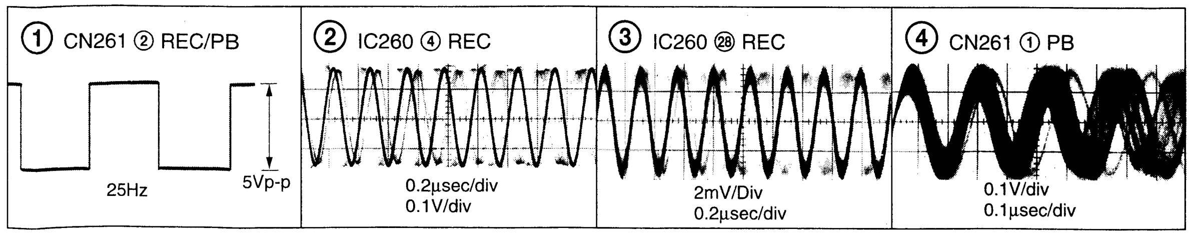

RP-231 BOARD (CONDUCTOR SIDE)
A
B
C
16
1
2
3
4
5
6
7
CN301
CN302
CN261
CN271
CN272
CN341
IC140
IC260
IC301
IC340
CN260
Q260
Q280
Q281
Q282
Q283
Q284
Q321
Q331
Q332
T321
T331
C280
C286
C358
L140
L261
L262
L263
L280
L281
L321
L322
L331
L341
PS331
JW201
JW202
JW203
JW204
JW205
JW206
JW207
JW208
JW209
JW210
JW211
JW212
JW213
JW214
JW215
JW216
JW217
JW218
JW219
JW220
JW221
JW222
JW223
JW224
JW225
JW226
JW227
JW228
JW229
JW230
JW231
JW232
JW233
JW234
JW235
JW236
JW237
JW238
JW239
JW240
JW241
JW242
JW243
JW244
JW245
JL260
JL261
JL262
JL263
JL264
JL269
JL281
JL282
JL340
JL341
JL355
JL356
JL357
JS322
JS331
①
②
③
④
1-669-390-
11


ML-15
<F900/F990 MODEL>
(SERIAL TRANSFER)
RP-231
(REC/PB AMP)
SE-69 <French MODEL>
NR-26
<EXCEPT French MODEL>
(PROCESSOR)
MA-316
VIDEO, AUDIO,
SERVO/SYSTEM CONTROL,
TUNER
AT-24
<F900/F990 MODEL>
(LARGE ANTENNA)
SW-300
<F900/F990 MODEL>
(REMOTE CONTROL RECEIVER)
POWER BLOCK
AT-23
<F900/F990 MODEL>
(SMALL ANTENNA)
FR-128
(MODE CONTROL)
DM-73
(OPERATION
SWITCHES)

RP-231 BOARD

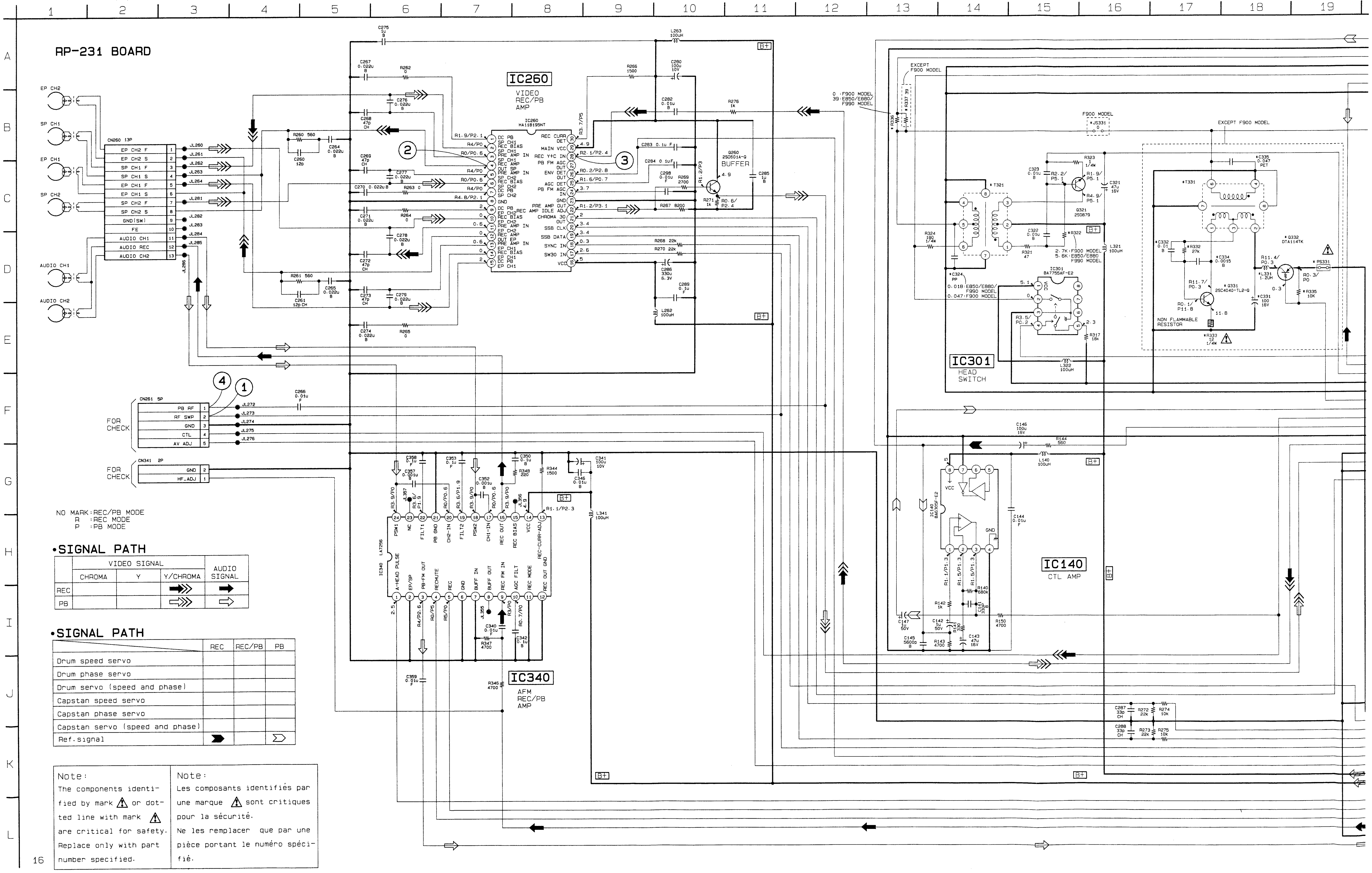
CN260	A-5	IC260	A-4
CN261	A-4	IC301	C-1
CN271	C-2	IC340	A-6
CN272	C-6		
CN301	A-1	Q260	A-3
CN302	B-1	Q321	C-2
CN341	A-7	Q331	A-2
		Q332	B-2
IC140	A-2		

RP-231 BOARD



RP-231 (REC/PB AMP) SCHEMATIC DIAGRAM

— Ref. No.: RP-231 Board; 1,000 Series —


RP-231 BOARD
EP CH2
SP CH1
EP CH1
SP CH2
AUDIO CH1
AUDIO CH2
CN260 13P
EP CH2 F
EP CH2 S
SP CH1 F
SP CH1 S
EP CH1 F
EP CH1 S
SP CH2 F
SP CH2 S
GND(SW)
FE
AUDIO CH1
AUDIO REC
AUDIO CH2
JL260
JL261
JL262
JL263
JL264
JL281
JL282
JL283
JL284
JL285
JL286
IC260
VIDEO
REC/PB
AMP
IC260
HA118195NT
DC PB SP CH1
REC BIAS SP CH1
PRE AMP IN SP CH1
REC AMP OUT SP
PRE AMP IN SP CH2
REC BIAS SP CH2
DC PB SP CH2
GND
DC PB EP CH2
REC BIAS EP CH2
PRE AMP IN EP CH2
REC AMP OUT EP
PRE AMP IN EP CH1
REC BIAS EP CH1
DC PB EP CH1
REC CURR DET
MAIN VCC
REC Y+C IN
PB FM AGC OUT
ENV DET OUT
AGC DET
PB FM AGC IN
GND
PRE AMP OUT
REC AMP IDLE ADJ
CHROMA 30 OUT
SSB CLK
SSB DATA
SYNC IN
SW30 IN
VCC
Q260
2SD601A-Q
BUFFER
②
③
④
①
B+
CN261 5P
PB RF
RF SWP
GND
CTL
AV ADJ
FOR CHECK
CN341 2P
GND
HF_ADJ
FOR CHECK
IC340 LA7256
PSW1
NC
FILT1
PB GND
CH2-IN
FILT2
PSW2
CH1-IN
REC OUT
REC BIAS
VCC
REC-CURR-ADJ
A-HEAD PULSE
EP/SP
PB-FM OUT
RECMUTE
REC
GND
BUFF IN
BUFF OUT
REC FM IN
AGC FILT
REC MODE
REC OUT GND
IC340
AFM
REC/PB
AMP
EXCEPT F900 MODEL
0 :F900 MODEL
39:E850/E880/F990 MODEL
F900 MODEL
*JS331
EXCEPT F900 MODEL
*T321
Q321
2SD879
2.7K:F900 MODEL
5.6K:E850/E880 F990 MODEL
*C324 PP
0.018:E850/E880/F990 MODEL
0.047:F900 MODEL
IC301
BA7755AF-E2
IC301
HEAD
SWITCH
*T331
*Q331
2SC4040-TL2-Q
*Q332
DTA114TK
*PS331
NON FLAMMABLE RESISTOR
*R333 12 1/4W
IC140
CTL AMP
VCC
GND
NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

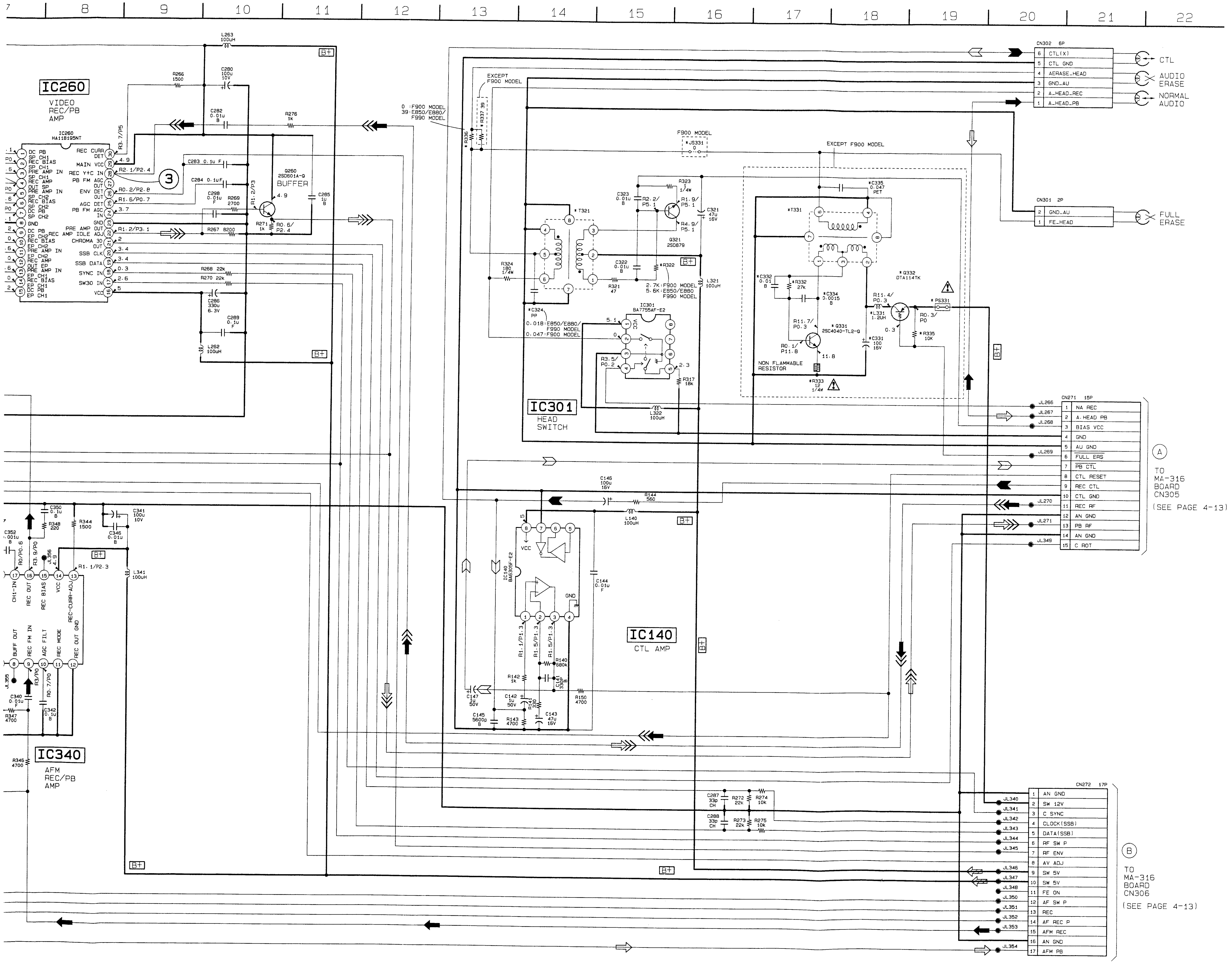
•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡》	➡
PB			⇨》	⇨

•SIGNAL PATH

	REC	REC/PB	PB
Drum speed servo			
Drum phase servo			
Drum servo (speed and phase)			
Capstan speed servo			
Capstan phase servo			
Capstan servo (speed and phase)			
Ref.signal	➤		▷

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.


7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
IC260
VIDEO
REC/PB
AMP
IC260
HA118195NT
DC PB
SP CH1
REC BIAS
SP CH1
PRE AMP IN
SP CH1
REC AMP
OUT SP
PRE AMP IN
SP CH2
REC BIAS
SP CH2
DC PB
SP CH2
GND
DC PB
EP CH2
REC BIAS
EP CH2
PRE AMP IN
EP CH2
REC AMP
OUT EP
PRE AMP IN
EP CH1
REC BIAS
EP CH1
DC PB
EP CH1
REC CURR DET
MAIN VCC
REC Y+C IN
PB FM AGC
ENV DET OUT
AGC DET
PB FM AGC IN
GND
PRE AMP IDLE ADJ
CHROMA 30
SSB CLK
SSB DATA
SYNC IN
SW30 IN
VCC
3
BUFFER
Q260
2SD601A-Q
L263 100uH
R266 1500
C280 100u 10V
C282 0.01u
R276 1K
C283 0.1u F
C284 0.1uF
C298 0.01u
R269 2700
C285 1u
R271 1K
R267 8200
R268 22k
R270 22k
C286 330u 6.3V
C289 0.1u
L262 100uH
B+
EXCEPT F900 MODEL
0 :F900 MODEL
39:E850/E880/F990 MODEL
R336
R337 39
F900 MODEL
JS331
EXCEPT F900 MODEL
T321
R324 180 1/4W
C324 PP
0.018:E850/E880/F990 MODEL
0.047:F900 MODEL
R323 1/4W
C323 0.01u
Q321 2SD879
C321 47u 16V
C322 0.01u
R322
R321 47
2.7K:F900 MODEL
5.6K:E850/E880 F990 MODEL
L321 100uH
IC301 BA7755AF-E2
R317 18K
L322 100uH
IC301
HEAD
SWITCH
T331
C335 0.047 PET
C332 0.01
R332 27k
C334 0.0015
Q331 2SC4040-TL2-Q
Q332 DTA114TK
L331 1.2uH
C331 100 16V
PS331
R335 10K
NON FLAMMABLE RESISTOR
R333 1/4W
CN302 6P
6 CTL(X)
5 CTL GND
4 AERASE_HEAD
3 GND_AU
2 A_HEAD_REC
1 A_HEAD_PB
CTL
AUDIO ERASE
NORMAL AUDIO
CN301 2P
2 GND_AU
1 FE_HEAD
FULL ERASE
CN271 15P
JL266
JL267
JL268
JL269
JL270
JL271
JL349
1 NA REC
2 A.HEAD PB
3 BIAS VCC
4 GND
5 AU GND
6 FULL ERS
7 PB CTL
8 CTL RESET
9 REC CTL
10 CTL GND
11 REC RF
12 AN GND
13 PB RF
14 AN GND
15 C ROT
A
TO
MA-316
BOARD
CN305
(SEE PAGE 4-13)
C146 100u 16V
R144 560
L140 100uH
IC140 BA6305F-E2
C144 0.01u
R140 680k
R142 1k
C147
C142 1u 50V
C145 5600p
R143 4700
C143 47u 16V
R150 4700
IC140
CTL AMP
C350 0.1u
R348 220
R344 1500
C341 100u 10V
C346 0.01u
C352 0.01u
L341 100uH
CH1-IN
REC OUT
REC BIAS
VCC
REC-CURR-ADJ
BUFF OUT
REC FM IN
AGC FILT
REC MODE
REC OUT GND
C340 0.01u
R347 4700
C342 0.1u
R346 4700
IC340
AFM
REC/PB
AMP
C287 33p CH
R272 22k
R274 10K
C288 33p CH
R273 22k
R275 10K
CN272 17P
JL340
JL341
JL342
JL343
JL344
JL345
JL346
JL347
JL348
JL350
JL351
JL352
JL353
JL354
1 AN GND
2 SW 12V
3 C SYNC
4 CLOCK(SSB)
5 DATA(SSB)
6 RF SW P
7 RF ENV
8 AV ADJ
9 SW 5V
10 SW 5V
11 FE ON
12 AF SW P
13 REC
14 AF REC P
15 AFM REC
16 AN GND
17 AFM PB
B
TO
MA-316
BOARD
CN306
(SEE PAGE 4-13)

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

- **For printed wiring boards.**
- ▨ : Pattern from the side which enables seeing.
- + : Through hole.

Caution :

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Pattern face side: (Component Side)	parts on the parts face side seen from the parts face are indicated.

- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistor are in ohms, 1/4W unless otherwise noted. Chip resistor are 1/10W unless otherwise noted. kΩ: 1000Ω, MΩ, : 1000kΩ.
- All capacitors are in µF unless otherwise noted. pF : µµF. 50V or less are not indicated except for electrolytics and tantalums.
- ▭ : panel designation.
- △ : internal component.
- ▬ : B+ Line.
- ▬ ▬ ▬ : B– Line.
- ⇨ : IN/OUT direction of (+,–) B LINE.
- Circled numbers refer to waveforms.
- Readings are taken with a PAL color-bar signal input.
- Voltage are dc between ground and measurement points.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

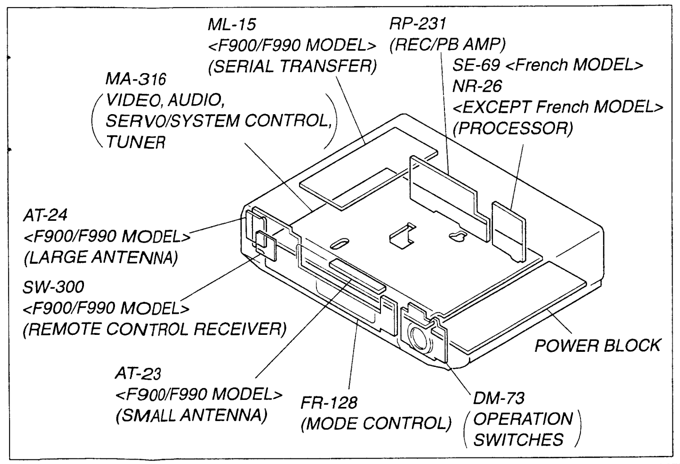
When indicating parts by reference number, please include the board name.

MA-316 (VIDEO, SERVO/SYSTEM CONTROL, AUDIO, TUNER) PRINTED WIRING BOARD

— Ref. No.: MA-316 Board; 2,000 Series —

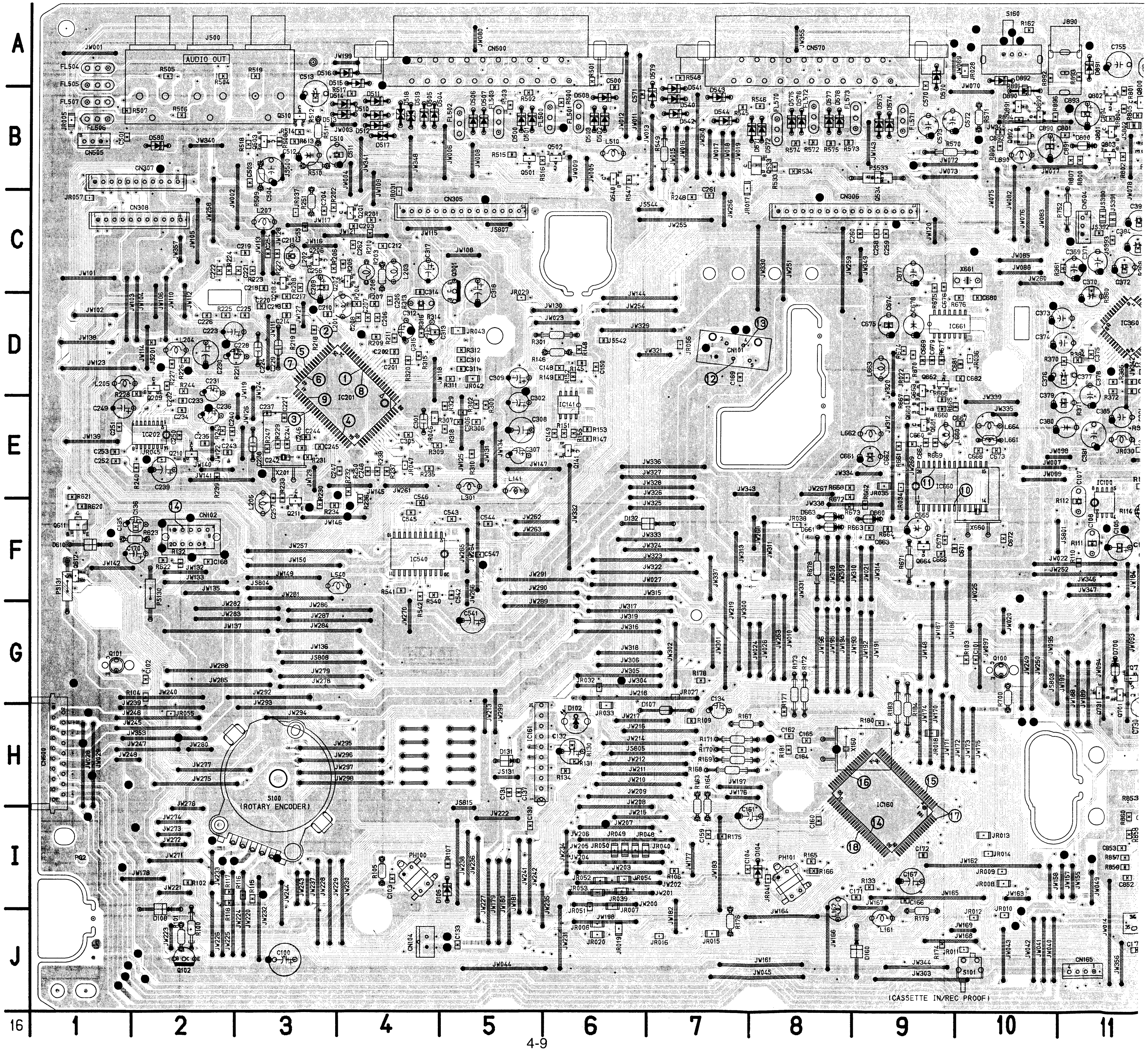
MA-316 BOARD

CN101	D-7
CN102	F-2
CN104	J-4
CN161	E-12
CN164	J-13
CN165	J-11
CN305	C-5
CN306	C-8
CN500	A-5
CN570	A-8
CN600	H-1
D102	H-6
D107	H-7
D108	I-2
D131	H-5
D132	F-7
D160	J-9
D500	B-5
D501	B-5
D502	B-6
D503	B-6
D504	B-4
D505	B-4
D506	B-5
D507	B-5
D508	B-6
D510	B-4
D511	B-4
D512	B-4
D513	B-4
D514	B-4
D515	A-4
D516	A-4
D517	B-4
D518	B-4
D519	B-4
D540	B-7
D541	B-7
D542	B-7
D543	B-7
D544	B-7
D570	A-9
D571	B-8
D572	B-8
D573	B-9
D574	B-9
D575	B-8
D576	B-8
D577	B-8
D578	B-8
D579	B-7
D580	B-2
D610	F-1
D660	F-9
D661	F-8
D663	F-8
D702	C-13
D750	B-13
D800	B-11
IC100	F-11
IC141	E-6
IC160	H-9
IC161	H-5
IC201	D-4
IC202	E-2
IC360	D-11
IC530	C-12
IC540	F-4
IC660	E-9
IC661	D-9
IC820	E-13
IC850	I-12
J500	A-2
PH100	I-4
PH101	H-8
Q100	G-10
Q101	G-1
Q102	J-2
Q141	E-6
Q201	C-4
Q202	C-4
Q208	C-3
Q209	D-2
Q210	E-2
Q211	F-3
Q301	C-5
Q501	B-5
Q502	B-6
Q510	B-3
Q533	B-8
Q534	B-9
Q540	B-6
Q611	F-1
Q612	F-1
Q613	J-11
Q660	E-9
Q661	E-9
Q662	D-9
Q663	D-9
Q664	F-9
Q703	F-13
Q751	A-12
Q752	A-12
Q800	B-11
Q801	B-11
Q802	B-11
Q803	B-11
Q804	B-11
Q820	D-13
Q821	D-12
Q850	H-12


ML-15
<F900/F990 MODEL>
(SERIAL TRANSFER)
RP-231
(REC/PB AMP)
SE-69 <French MODEL>
NR-26
<EXCEPT French MODEL>
(PROCESSOR)
MA-316
VIDEO, AUDIO,
SERVO/SYSTEM CONTROL,
TUNER
AT-24
<F900/F990 MODEL>
(LARGE ANTENNA)
SW-300
<F900/F990 MODEL>
(REMOTE CONTROL RECEIVER)
POWER BLOCK
AT-23
<F900/F990 MODEL>
(SMALL ANTENNA)
FR-128
(MODE CONTROL)
DM-73
OPERATION
SWITCHES

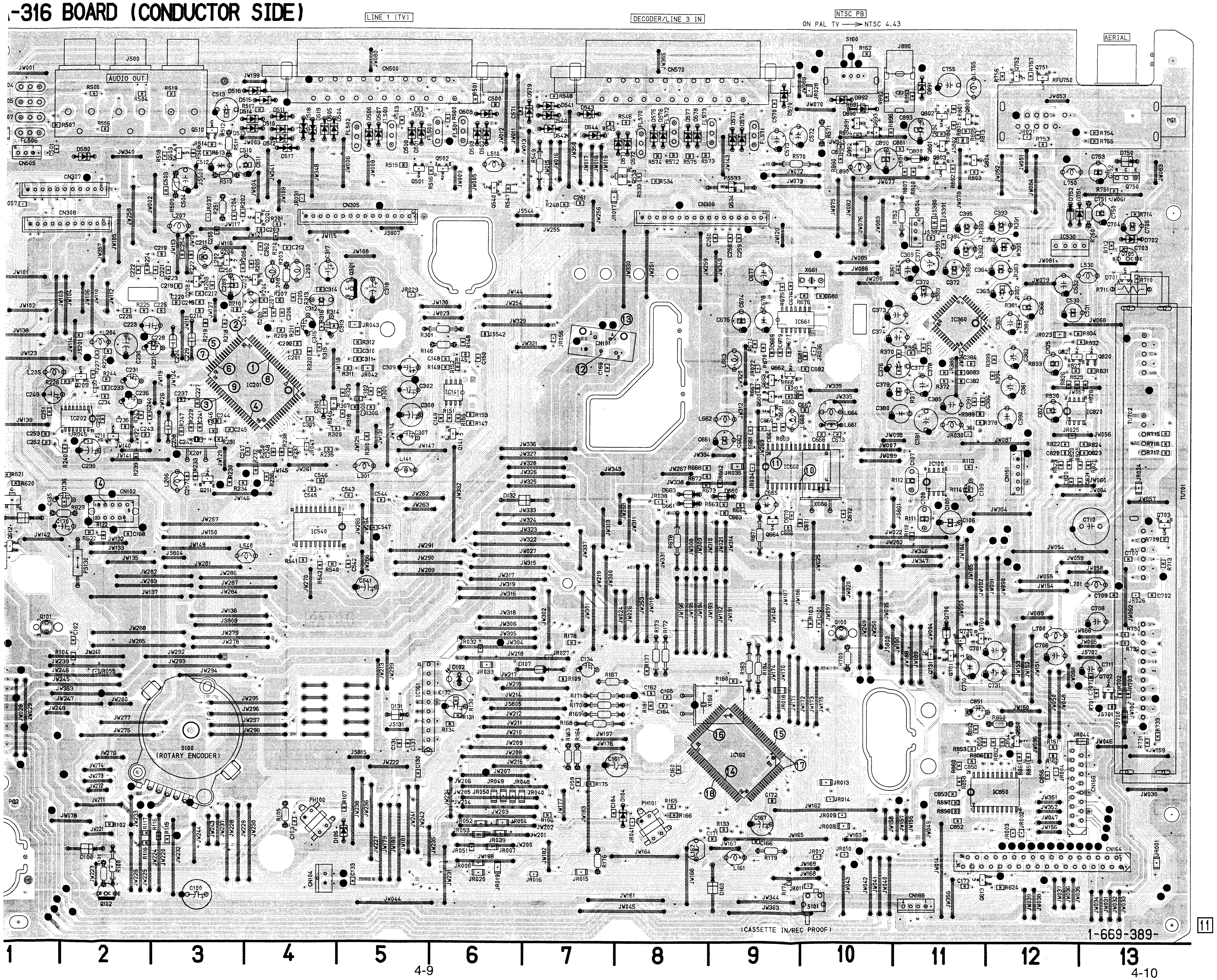
There are few cases that the part printed on this diagram isn't mounted in this model.

MA-316 BOARD (CONDUCTOR SIDE)


LINE 1 (TV)
DECODER/LINE 3 IN
NTSC PB
ON PAL TV → NTSC 4.43
AUDIO OUT
J500
CN500
CN570
CN305
CN306
CN307
CN308
CN505
CN102
CN104
CN165
CN600
IC201
IC202
IC540
IC141
IC160
IC660
IC661
IC100
IC360
S100
(ROTARY ENCODER)
S101
PH100
PH101
(CASSETTE IN/REC PROOF)
A
B
C
D
E
F
G
H
I
J
16
1
2
3
4
5
6
7
8
9
10
11

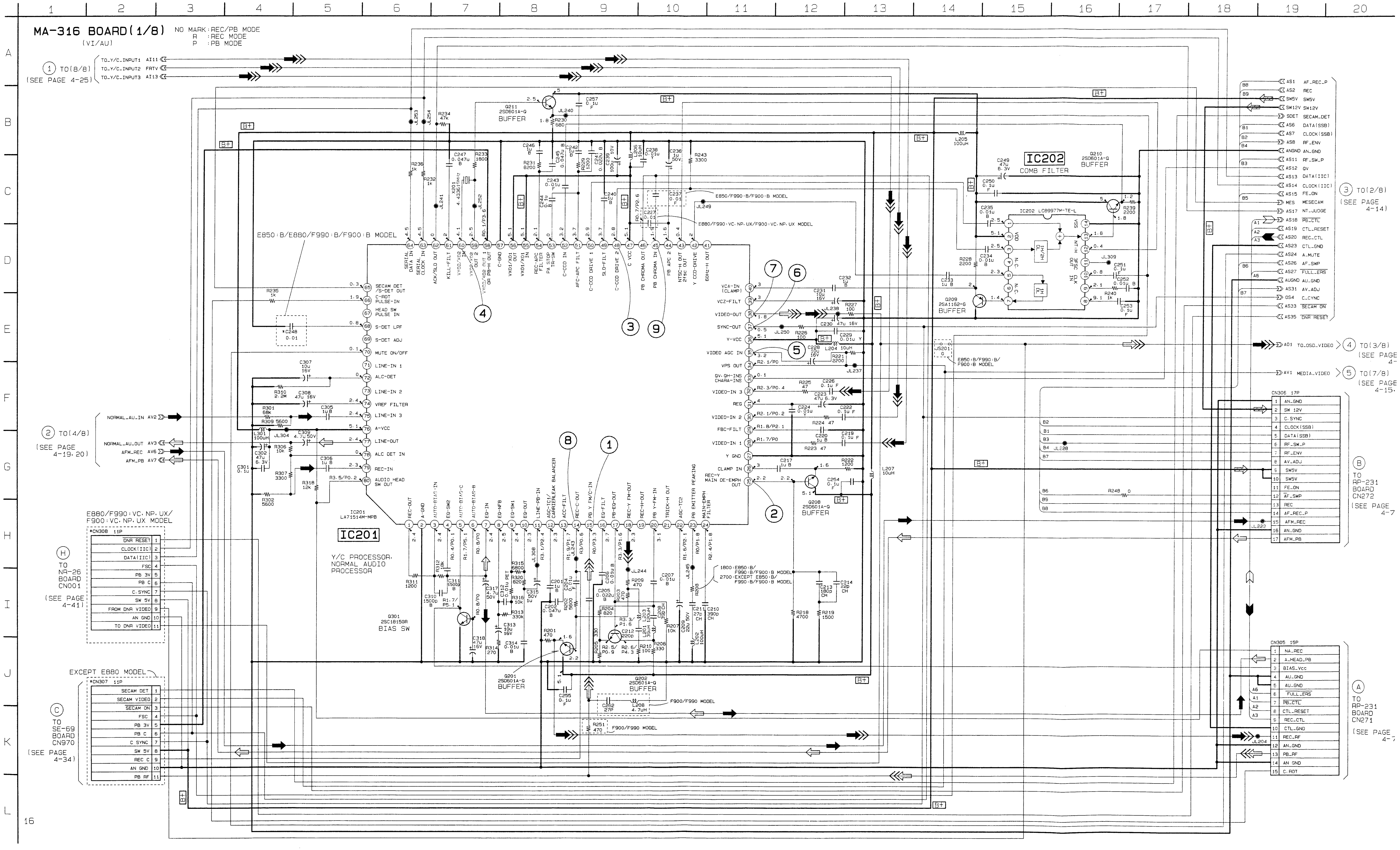
e few cases that the part printed on this diagram isn't mounted in this model.

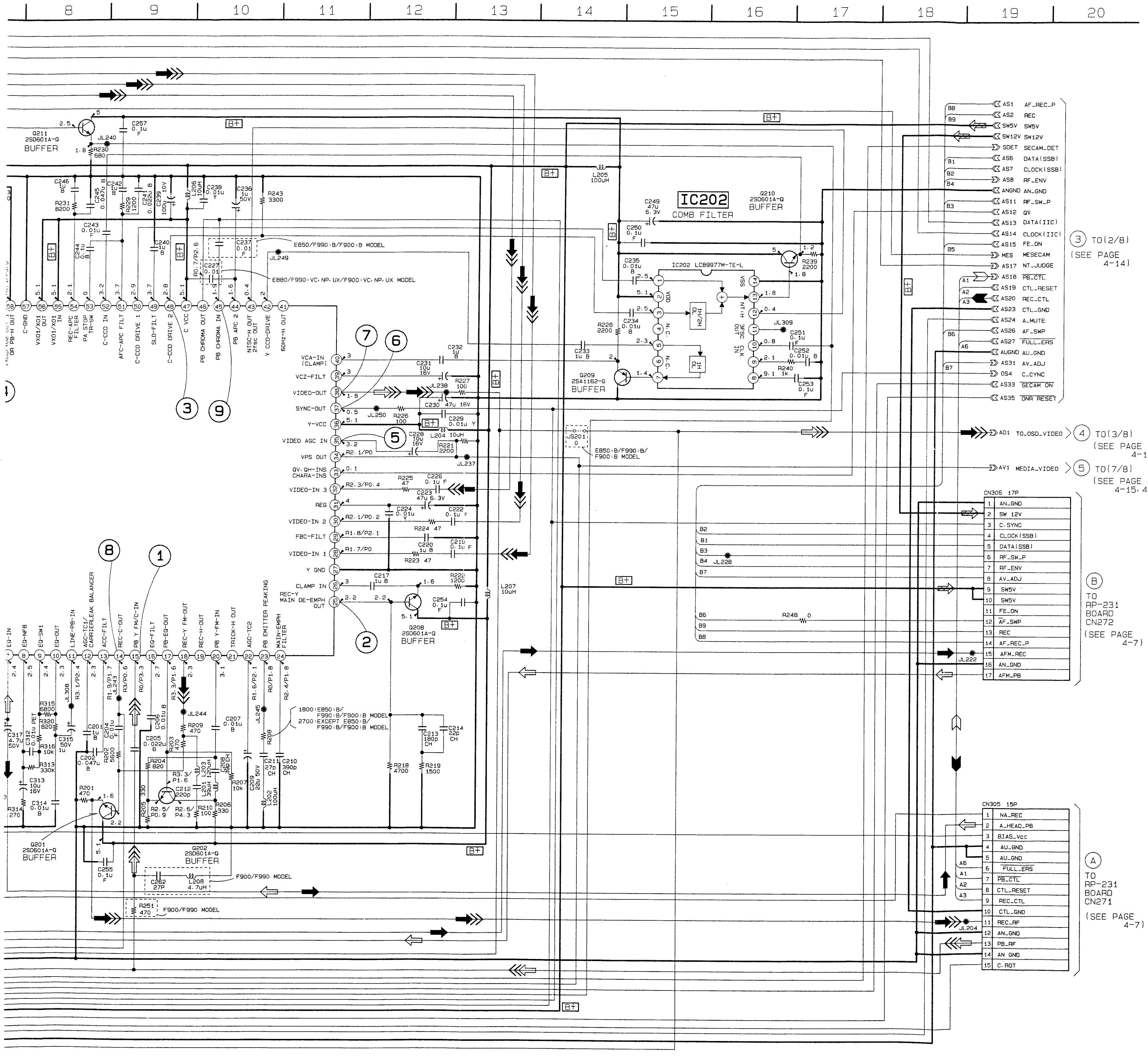
-316 BOARD (CONDUCTOR SIDE)


LINE 1 (TV)
DECODER/LINE 3 IN
NTSC PB
ON PAL TV ——→ NTSC 4.43
AERIAL
AUDIO OUT
J500
CN500
CN570
CN305
CN306
CN307
CN308
CN505
IC201
IC202
IC540
IC660
IC661
IC360
IC100
IC160
IC161
IC850
IC820
IC530
TU701
CN164
CN165
CN166
CN102
CN104
CN161
S100 (ROTARY ENCODER)
S160
S101
PH100
PH101
(CASSETTE IN/REC PROOF)
1-669-389-
11
1
2
3
4
5
6
7
8
9
10
11
12
13

MA-316 (VIDEO, NORMAL AUDIO) SCHEMATIC DIAGRAM

— Ref. No.: MA-316 Board; 2,000 Series —


MA-316 BOARD(1/8)
(VI/AU)
NO MARK : REC/PB MODE
R : REC MODE
P : PB MODE
① TO(8/8) (SEE PAGE 4-25)
TO_Y/C_INPUT1 AI11
TO_Y/C_INPUT2 FRTV
TO_Y/C_INPUT3 AI13
② TO(4/8) (SEE PAGE 4-19, 20)
NORMAL_AU_IN AV2
NORMAL_AU_OUT AV3
AFM_REC AV6
AFM_PB AV7
IC201 LA71514M-MPB
IC201
Y/C PROCESSOR, NORMAL AUDIO PROCESSOR
IC202
COMB FILTER
IC202 LC89977M-TE-L
Q211 2SD601A-Q BUFFER
Q210 2SD601A-Q BUFFER
Q209 2SA1162-G BUFFER
Q208 2SD601A-Q BUFFER
Q201 2SD601A-Q BUFFER
Q202 2SD601A-Q BUFFER
Q301 2SC1815GR BIAS SW
E850:B/E880/F990:B/F900:B MODEL
E850/F990:B/F900:B MODEL
E880/F990:VC, NP, UX/F900:VC, NP, UX MODEL
F900/F990 MODEL
E880/F990:VC, NP, UX/ F900:VC, NP, UX MODEL
CN308 11P
Ⓗ TO NR-26 BOARD CN001 (SEE PAGE 4-41)
EXCEPT E880 MODEL
CN307 11P
Ⓒ TO SE-69 BOARD CN970 (SEE PAGE 4-34)
③ TO(2/8) (SEE PAGE 4-14)
④ TO(3/8) (SEE PAGE 4-
⑤ TO(7/8) (SEE PAGE 4-15
TO_OSD_VIDEO
MEDIA_VIDEO
CN306 17P
Ⓑ TO RP-231 BOARD CN272 (SEE PAGE 4-7
CN305 15P
Ⓐ TO RP-231 BOARD CN271 (SEE PAGE 4-7
16

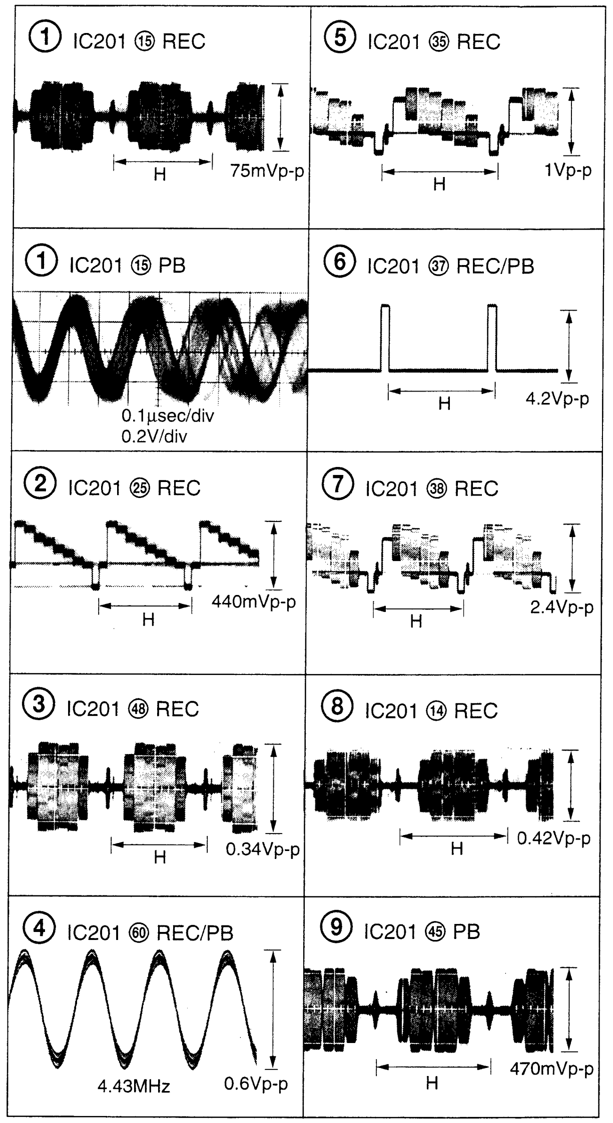

8
9
10
11
12
13
14
15
16
17
18
19
20
Q211 2SD601A-Q BUFFER
IC202 COMB FILTER
IC202 LC89977M-TE-L
Q210 2SD601A-Q BUFFER
Q209 2SA1162-G BUFFER
Q208 2SD601A-Q BUFFER
Q201 2SD601A-Q BUFFER
Q202 2SD601A-Q BUFFER
E850/F990·B/F900·B MODEL
E880/F990·VC·NP·UX/F900·VC·NP·UX MODEL
F900/F990 MODEL
1800:E850·B/F990·B/F900·B MODEL
2700:EXCEPT E850·B/F990·B/F900·B MODEL
VCA-IN (CLAMP)
VCZ-FILT
VIDEO-OUT
SYNC-OUT
Y-VCC
VIDEO AGC IN
VPS OUT
QV. GH-INS CHARA-INS
VIDEO-IN 3
REG
VIDEO-IN 2
FBC-FILT
VIDEO-IN 1
Y GND
CLAMP IN
REC-Y MAIN DE-EMPH OUT
PB EMITTER PEAKING
MAIN-EMPH FILTER
B8
B9
B1
B2
B4
B3
B5
A1
A2
A3
B6
A6
B7
AS1 AF_REC_P
AS2 REC
SW5V SW5V
SW12V SW12V
SDET SECAM_DET
AS6 DATA(SSB)
AS7 CLOCK(SSB)
AS8 RF_ENV
ANGND AN_GND
AS11 RF_SW_P
AS12 QV
AS13 DATA(IIC)
AS14 CLOCK(IIC)
AS15 FE_ON
MES MESECAM
AS17 NT_JUDGE
AS18 PB_CTL
AS19 CTL_RESET
AS20 REC_CTL
AS23 CTL_GND
AS24 A_MUTE
AS26 AF_SWP
AS27 FULL_ERS
AUGND AU_GND
AS31 AV_ADJ
OS4 C_CYNC
AS33 SECAM ON
AS35 DNR RESET
③ TO(2/8) (SEE PAGE 4-14)
AO1 TO_OSD_VIDEO ④ TO(3/8) (SEE PAGE 4-18)
AV1 MEDIA_VIDEO ⑤ TO(7/8) (SEE PAGE 4-15, 4-23)
CN306 17P
1 AN_GND
2 SW 12V
3 C. SYNC
4 CLOCK(SSB)
5 DATA(SSB)
6 RF_SW_P
7 RF_ENV
8 AV_ADJ
9 SW5V
10 SW5V
11 FE_ON
12 AF_SWP
13 REC
14 AF_REC_P
15 AFM_REC
16 AN_GND
17 AFM_PB
Ⓑ TO RP-231 BOARD CN272 (SEE PAGE 4-7)
JL222
CN305 15P
1 NA_REC
2 A_HEAD_PB
3 BIAS_Vcc
4 AU_GND
5 AU_GND
6 FULL_ERS
7 PB_CTL
8 CTL_RESET
9 REC_CTL
10 CTL_GND
11 REC_RF
12 AN_GND
13 PB_RF
14 AN GND
15 C. ROT
Ⓐ TO RP-231 BOARD CN271 (SEE PAGE 4-7)
JL204
B+
①
②
③
⑤
⑥
⑦
⑧
⑨

•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡≫	➡
PB			⇨≫	⇨

	REC	REC/PB	PB
Drum speed servo			
Drum phase servo			
Drum servo (speed and phase)			
Capstan speed servo			
Capstan phase servo			
Capstan servo (speed and phase)			
Ref. signal	➤		▷

MA-316 BOARD (1/3)



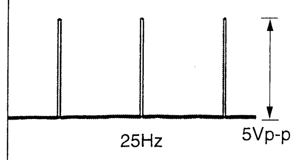
MA-316 (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAM

— Ref. No.: MA-316 Board; 2,000 Series —

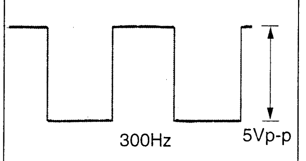
- See page 4-9 for MA-316 BOARD printed wiring board.

MA-316 BOARD (2/3)

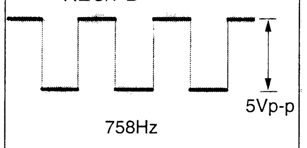
⑫ CN101 ③ REC/PB



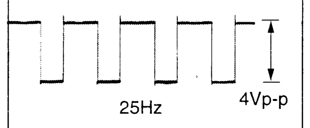
⑬ CN101 ④ REC/PB



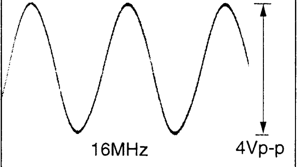
⑭ CN102 ③, IC160 ⑳ REC/PB



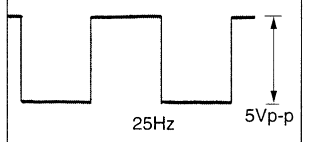
⑮ IC160 ⑦ REC/PB



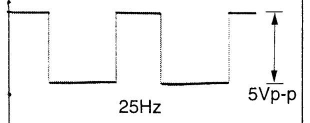
⑯ IC160 ㊷ REC/PB

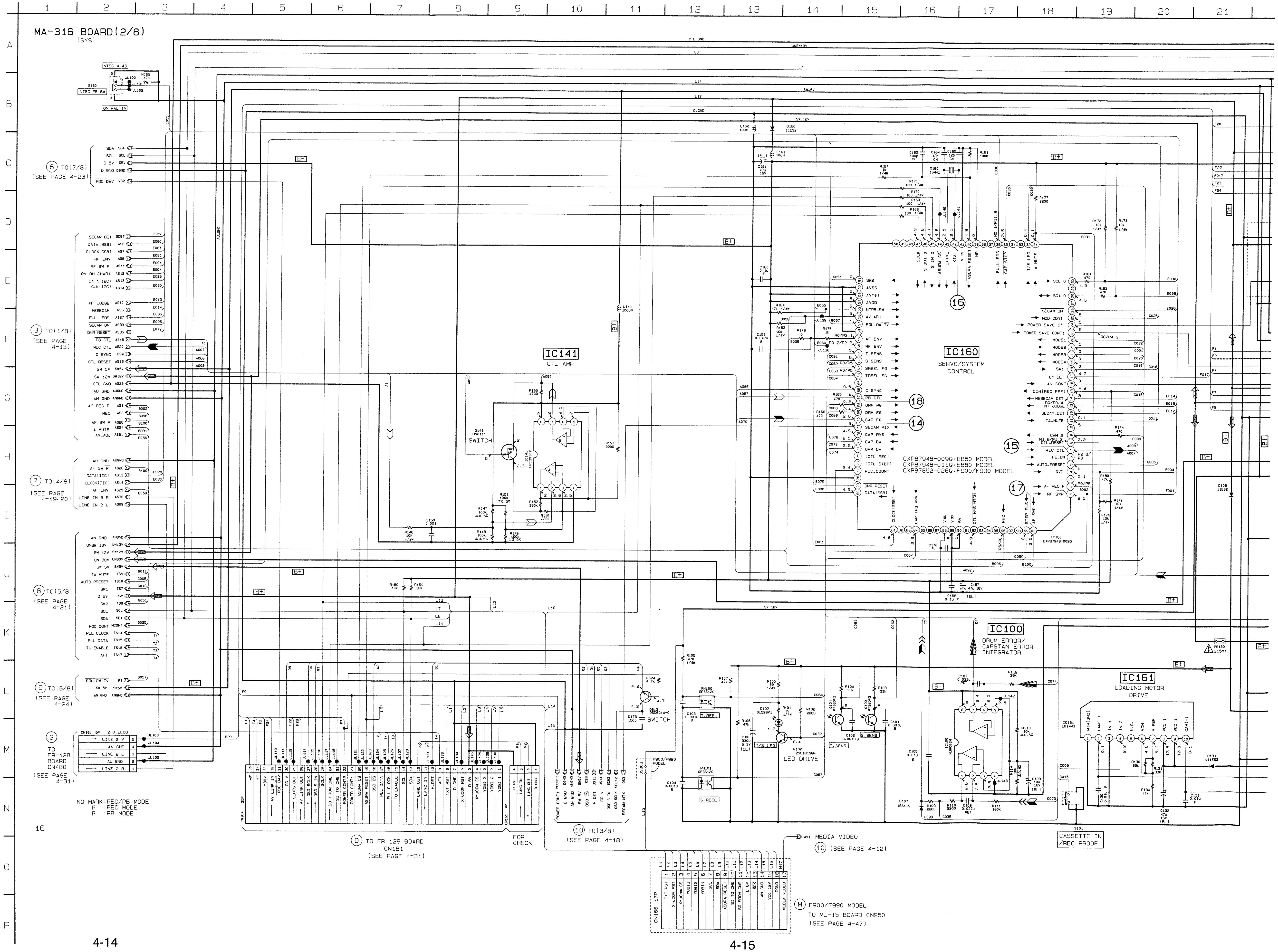


⑰ IC160 ①,⑩⓪ REC/PB

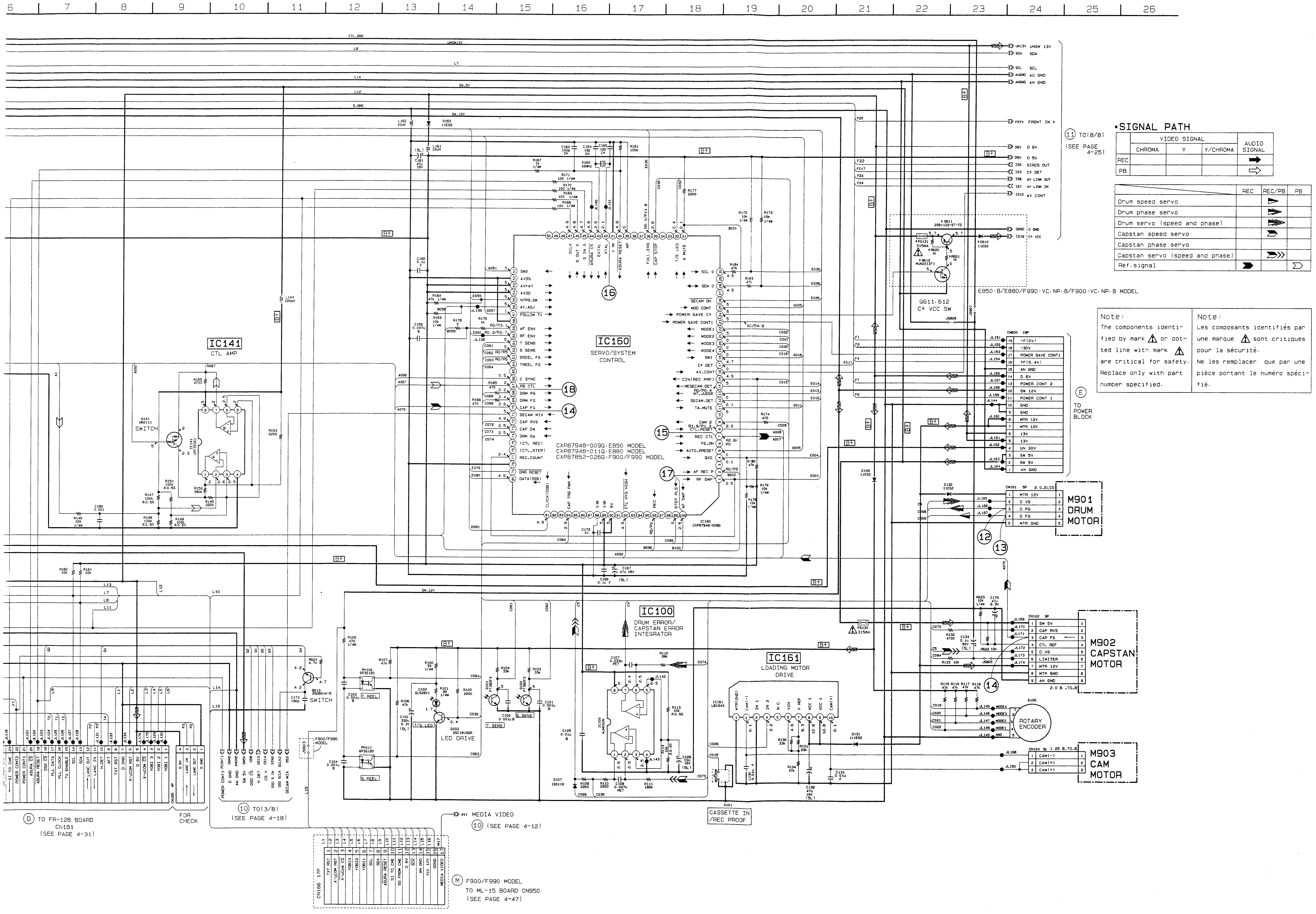


⑱ IC160 ⑥⑦ REC/PB




MA-316 BOARD(2/8)
(SYS)
NTSC 4.43
NTSC PB SW
ON PAL TV
S160
⑥ TO(7/8)
(SEE PAGE 4-23)
③ TO(1/8)
(SEE PAGE 4-13)
⑦ TO(4/8)
(SEE PAGE 4-19,20)
⑧ TO(5/8)
(SEE PAGE 4-21)
⑨ TO(6/8)
(SEE PAGE 4-24)
Ⓖ TO FR-128 BOARD CN490
(SEE PAGE 4-31)
Ⓓ TO FR-128 BOARD CN181
(SEE PAGE 4-31)
⑩ TO(3/8)
(SEE PAGE 4-18)
MEDIA VIDEO
⑩ (SEE PAGE 4-12)
Ⓜ F900/F990 MODEL
TO ML-15 BOARD CN950
(SEE PAGE 4-47)
NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE
IC141
CTL AMP
Q141
SWITCH
IC160
SERVO/SYSTEM CONTROL
CXP87948-009Q:E850 MODEL
CXP87948-011Q:E880 MODEL
CXP87852-026Q:F900/F990 MODEL
IC100
DRUM ERROR/
CAPSTAN ERROR
INTEGRATOR
IC161
LOADING MOTOR
DRIVE
LED DRIVE
SWITCH
T.REEL
S.REEL
T.SENS
S.SENS
CASSETTE IN
/REC PROOF
FOR CHECK
CN161 5P
CN164 35P
CN165 4P
CN166 17P
PS130 315mA
16
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P

printed wiring board.


IC160
SERVO/SYSTEM CONTROL
CXP87948-009Q:E850 MODEL
CXP87948-011Q:E880 MODEL
CXP87852-026Q:F900/F990 MODEL
IC141
CTL AMP
Q141 UN2111 SWITCH
IC100
DRUM ERROR/ CAPSTAN ERROR INTEGRATOR
IC161
LOADING MOTOR DRIVE
Q102 2SC1815GR LED DRIVE
Q613 2SD601A-Q SWITCH
Q611·612 C+ VCC SW
E850:B/E880/F990:VC·NP·B/F900:VC·NP·B MODEL
M901 DRUM MOTOR
M902 CAPSTAN MOTOR
M903 CAM MOTOR
ROTARY ENCODER
CASSETTE IN /REC PROOF
Ⓔ TO POWER BLOCK
⑪ TO(8/8) (SEE PAGE 4-25)
Ⓓ TO FR-128 BOARD CN181 (SEE PAGE 4-31)
FOR CHECK
⑩ TO(3/8) (SEE PAGE 4-18)
MEDIA VIDEO ⑩ (SEE PAGE 4-12)
Ⓜ F900/F990 MODEL TO ML-15 BOARD CN950 (SEE PAGE 4-47)
CN166 17P
CN500 19P
CN101 5P
CN102 9P
CN104 3P
T.REEL
S.REEL
T/S.LED
T.SENS
S.SENS

•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				➡
PB				⇨

	REC	REC/PB	PB
Drum speed servo		▶	
Drum phase servo		▶▶	
Drum servo (speed and phase)		▶▶▶	
Capstan speed servo		➤	
Capstan phase servo			
Capstan servo (speed and phase)		➤»	
Ref.signal	➤		▷

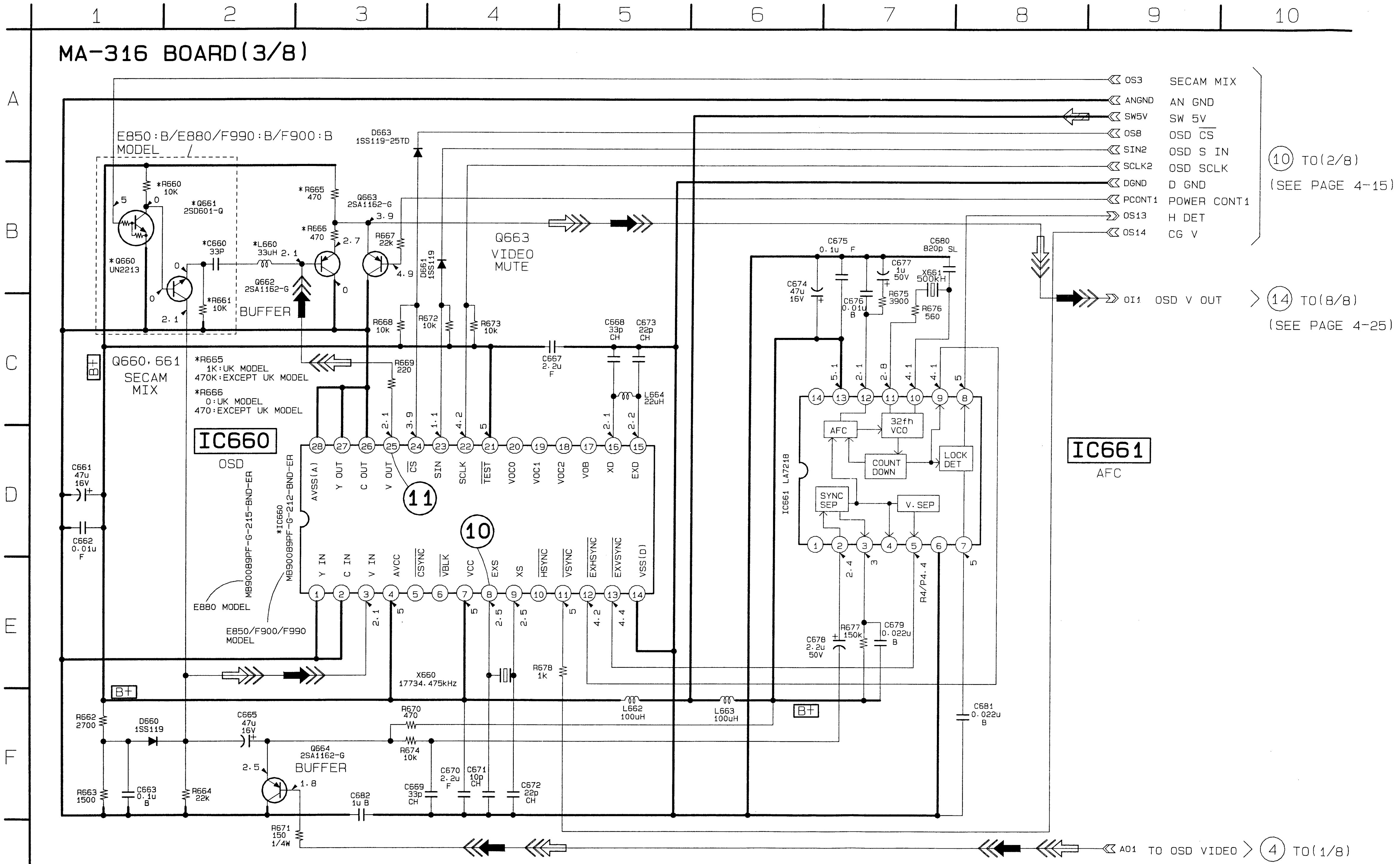
Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

MA-316 (ON SCREEN DISPLAY) SCHEMATIC DIAGRAM

— Ref. No.: MA-316 Board; 2,000 Series —

- See page 4-9 for MA-316 BOARD printed wiring board.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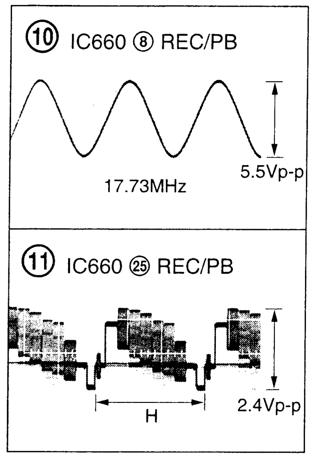
A
B
C
D
E
F
G
MA-316 BOARD(3/8)
E850:B/E880/F990:B/F900:B MODEL
*R660 10K
*Q661 2SD601-Q
*Q660 UN2213
*C660 33P
*L660 33uH
Q662 2SA1162-G
*R661 10K
BUFFER
*R665 470
*R666 470
Q663 2SA1162-G
R667 22k
D663 1SS119-25TD
D661 1SS119
Q663 VIDEO MUTE
R668 10k
R672 10k
R673 10k
R669 220
Q660, 661 SECAM MIX
*R665 1K:UK MODEL 470K:EXCEPT UK MODEL
*R666 0:UK MODEL 470:EXCEPT UK MODEL
B+
IC660 OSD
*IC660 MB90089PF-G-212-BND-ER
MB90089PF-G-215-BND-ER
E880 MODEL
E850/F900/F990 MODEL
AVSS(A)
Y OUT
C OUT
V OUT
CS
SIN
SCLK
TEST
VOCO
VOC1
VOC2
VOB
XD
EXD
Y IN
C IN
V IN
AVCC
CSYNC
VBLK
VCC
EXS
XS
HSYNC
VSYNC
EXHSYNC
EXVSYNC
VSS(D)
C667 2.2u F
C668 33p CH
C673 22p CH
L664 22uH
C661 47u 16V
C662 0.01u F
X650 17734.475kHz
R678 1k
L662 100uH
L663 100uH
C675 0.1u F
C680 820p SL
C677 1u 50V
X661 500kHz
C674 47u 16V
C676 0.01u B
R675 3900
R676 560
IC661 L4721B
AFC
32fh VCO
COUNT DOWN
LOCK DET
SYNC SEP
V.SEP
IC661 AFC
R677 150k
C678 2.2u 50V
C679 0.022u B
R4/P4.4
C681 0.022u B
R662 2700
D660 1SS119
C665 47u 16V
R670 470
R674 10k
Q664 2SA1162-G BUFFER
R663 1500
C663 0.1u B
R664 22k
C682 1u B
C669 33p CH
C670 2.2u F
C671 10p CH
C672 22p CH
R671 150 1/4W
OS3 SECAM MIX
ANGND AN GND
SW5V SW 5V
OS8 OSD CS
SIN2 OSD S IN
SCLK2 OSD SCLK
DGND D GND
PCONT1 POWER CONT1
OS13 H DET
OS14 CG V
(10) TO(2/8) (SEE PAGE 4-15)
OI1 OSD V OUT
(14) TO(8/8) (SEE PAGE 4-25)
AO1 TO OSD VIDEO
(4) TO(1/8) (SEE PAGE 4-13)
(10)
(11)
16

NO MARK : REC/PB MODE
R : REC MODE
P : PB MODE

•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡》	
PB			⇨》	

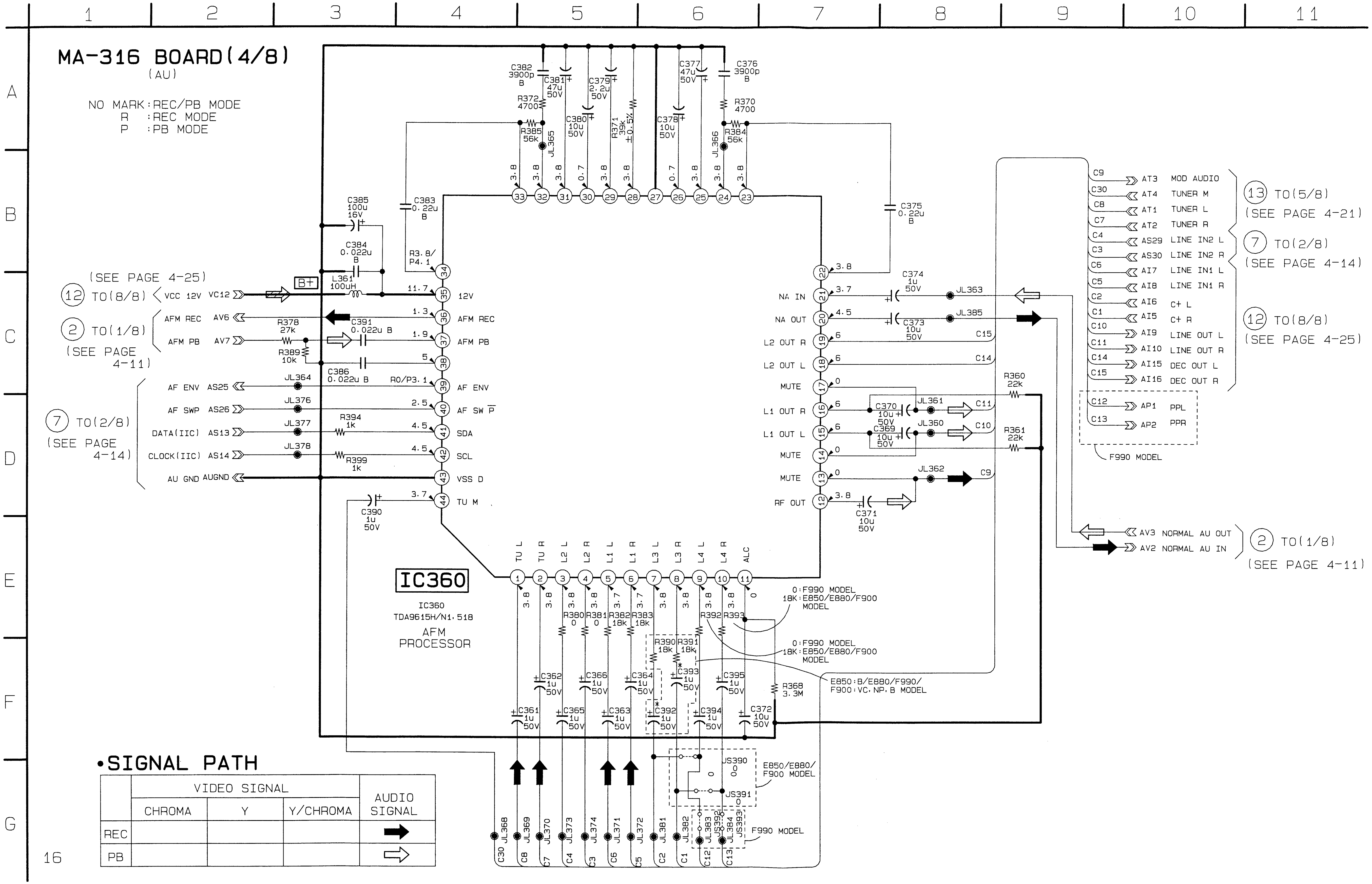
MA-316 BOARD (3/3)



MA-316 (AFM AUDIO) SCHEMATIC DIAGRAM

— Ref. No.: MA-316 Board; 2,000 Series —

• See page 4-9 for MA-316 BOARD printed wiring board.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A
B
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MA-316 BOARD(4/8)
(AU)
NO MARK : REC/PB MODE
R : REC MODE
P : PB MODE
(SEE PAGE 4-25)
⑫ TO(8/8)
VCC 12V VC12
B+
② TO(1/8)
(SEE PAGE 4-11)
AFM REC AV6
AFM PB AV7
⑦ TO(2/8)
(SEE PAGE 4-14)
AF ENV AS25
AF SWP AS26
DATA(IIC) AS13
CLOCK(IIC) AS14
AU GND AUGND
C382 3900p B
C381 47u 50V
C379 2.2u 50V
C377 47u 50V
C376 3900p B
R372 4700
R370 4700
C380 10u 50V
R371 39k ±0.5%
C378 10u 50V
R385 56k
R384 56k
JL365
JL366
C385 100u 16V
C383 0.22u B
C384 0.022u B
R3.8/P4.1
L361 100uH
R378 27k
R389 10k
C391 0.022u B
C386 0.022u B
JL364
JL376
JL377
JL378
R394 1k
R399 1k
C390 1u 50V
C375 0.22u B
C374 1u 50V
C373 10u 50V
C370 10u 50V
C369 10u 50V
C371 10u 50V
JL363
JL385
JL361
JL360
JL362
R360 22k
R361 22k
12V
AFM REC
AFM PB
AF ENV
AF SW P
SDA
SCL
VSS D
TU M
NA IN
NA OUT
L2 OUT R
L2 OUT L
MUTE
L1 OUT R
L1 OUT L
MUTE
MUTE
RF OUT
TU L
TU R
L2 L
L2 R
L1 L
L1 R
L3 L
L3 R
L4 L
L4 R
ALC
IC360
IC360
TDA9615H/N1.518
AFM PROCESSOR
R380 0
R381 0
R382 18k
R383 18k
R392
R393
0:F990 MODEL
18K:E850/E880/F900 MODEL
R390 18k
R391 18k
0:F990 MODEL
18K:E850/E880/F900 MODEL
E850:B/E880/F990/F900:VC,NP,B MODEL
R368 3.3M
C362 1u 50V
C366 1u 50V
C364 1u 50V
C393 1u 50V
C395 1u 50V
C361 1u 50V
C365 1u 50V
C363 1u 50V
C392 1u 50V
C394 1u 50V
C372 10u 50V
JS390
JS391
E850/E880/F900 MODEL
F990 MODEL
JL368
JL369
JL370
JL373
JL374
JL371
JL372
JL381
JL382
JL383
JS392
JL384
JS393
C30
C8
C7
C4
C3
C6
C5
C2
C1
C12
C13
C9
C30
C8
C7
C4
C3
C6
C5
C2
C1
C10
C11
C14
C15
AT3 MOD AUDIO
AT4 TUNER M
AT1 TUNER L
AT2 TUNER R
AS29 LINE IN2 L
AS30 LINE IN2 R
AI7 LINE IN1 L
AI8 LINE IN1 R
AI6 C+ L
AI5 C+ R
AI9 LINE OUT L
AI10 LINE OUT R
AI15 DEC OUT L
AI16 DEC OUT R
⑬ TO(5/8)
(SEE PAGE 4-21)
⑦ TO(2/8)
(SEE PAGE 4-14)
⑫ TO(8/8)
(SEE PAGE 4-25)
C12 AP1 PPL
C13 AP2 PPR
F990 MODEL
AV3 NORMAL AU OUT
AV2 NORMAL AU IN
② TO(1/8)
(SEE PAGE 4-11)
16

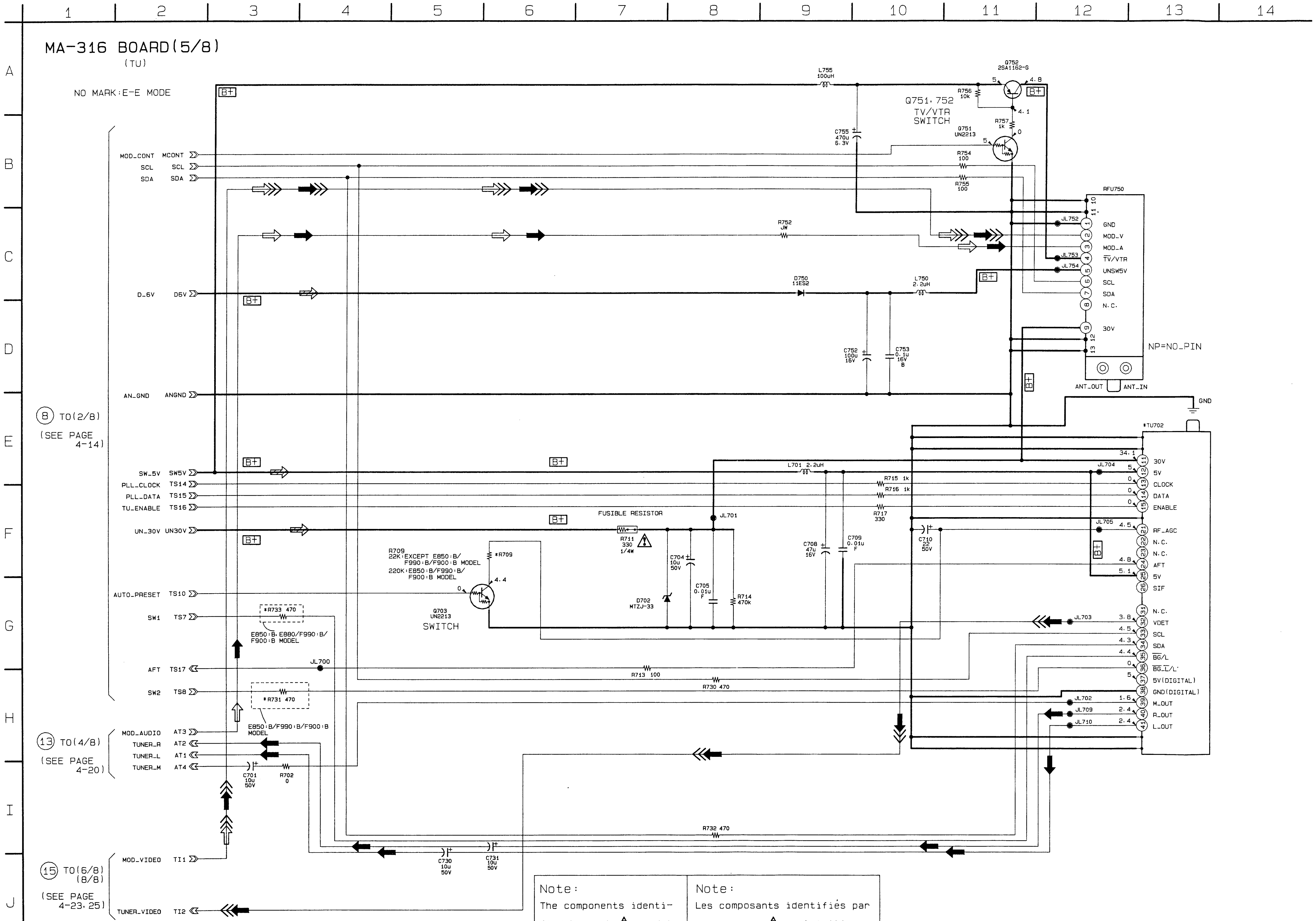
•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				➡
PB				⇨

MA-316 (TUNER) SCHEMATIC DIAGRAM

— Ref. No.: MA-316 Board; 2,000 Series —

- See page 4-9 for MA-316 BOARD printed wiring board.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9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
J
K
MA-316 BOARD(5/8)
(TU)
NO MARK:E-E MODE
MOD_CONT MCONT
SCL SCL
SDA SDA
D_6V D6V
AN_GND ANGND
SW_5V SW5V
PLL_CLOCK TS14
PLL_DATA TS15
TU_ENABLE TS16
UN_30V UN30V
AUTO_PRESET TS10
SW1 TS7
AFT TS17
SW2 TS8
MOD_AUDIO AT3
TUNER_R AT2
TUNER_L AT1
TUNER_M AT4
MOD_VIDEO TI1
TUNER_VIDEO TI2
8 TO(2/8)
(SEE PAGE 4-14)
13 TO(4/8)
(SEE PAGE 4-20)
15 TO(6/8) (8/8)
(SEE PAGE 4-23, 25)
B+
L755 100uH
C755 470u 6.3V
Q752 2SA1162-G
Q751, 752 TV/VTR SWITCH
R756 10k
R757 1k
Q751 UN2213
R754 100
R755 100
R752 JW
D750 11ES2
L750 2.2uH
C752 100u 16V
C753 0.1u 16V B
RFU750
GND
MOD_V
MOD_A
TV/VTR
UNSW5V
SCL
SDA
N.C.
30V
NP=NO_PIN
ANT_OUT
ANT_IN
JL752
JL753
JL754
GND
*TU702
L701 2.2uH
R715 1k
R716 1k
R717 330
JL701
JL704
JL705
FUSIBLE RESISTOR
R711 330 1/4W
C704 10u 50V
C705 0.01u F
R714 470k
D702 MTZJ-33
C708 47u 16V
C709 0.01u F
C710 22 50V
R709 22K:EXCEPT E850:B/F990:B/F900:B MODEL
220K:E850:B/F990:B/F900:B MODEL
*R709
Q703 UN2213
SWITCH
*R733 470
E850:B, E880/F990:B/F900:B MODEL
JL700
*R731 470
E850:B/F990:B/F900:B MODEL
R713 100
R730 470
R732 470
C701 10u 50V
R702 0
C730 10u 50V
C731 10u 50V
30V
5V
CLOCK
DATA
ENABLE
RF_AGC
N.C.
N.C.
AFT
5V
SIF
N.C.
VDET
SCL
SDA
BG/L
BG_L/L'
5V(DIGITAL)
GND(DIGITAL)
M_OUT
R_OUT
L_OUT
JL703
JL702
JL709
JL710

•SIGNAL PATH

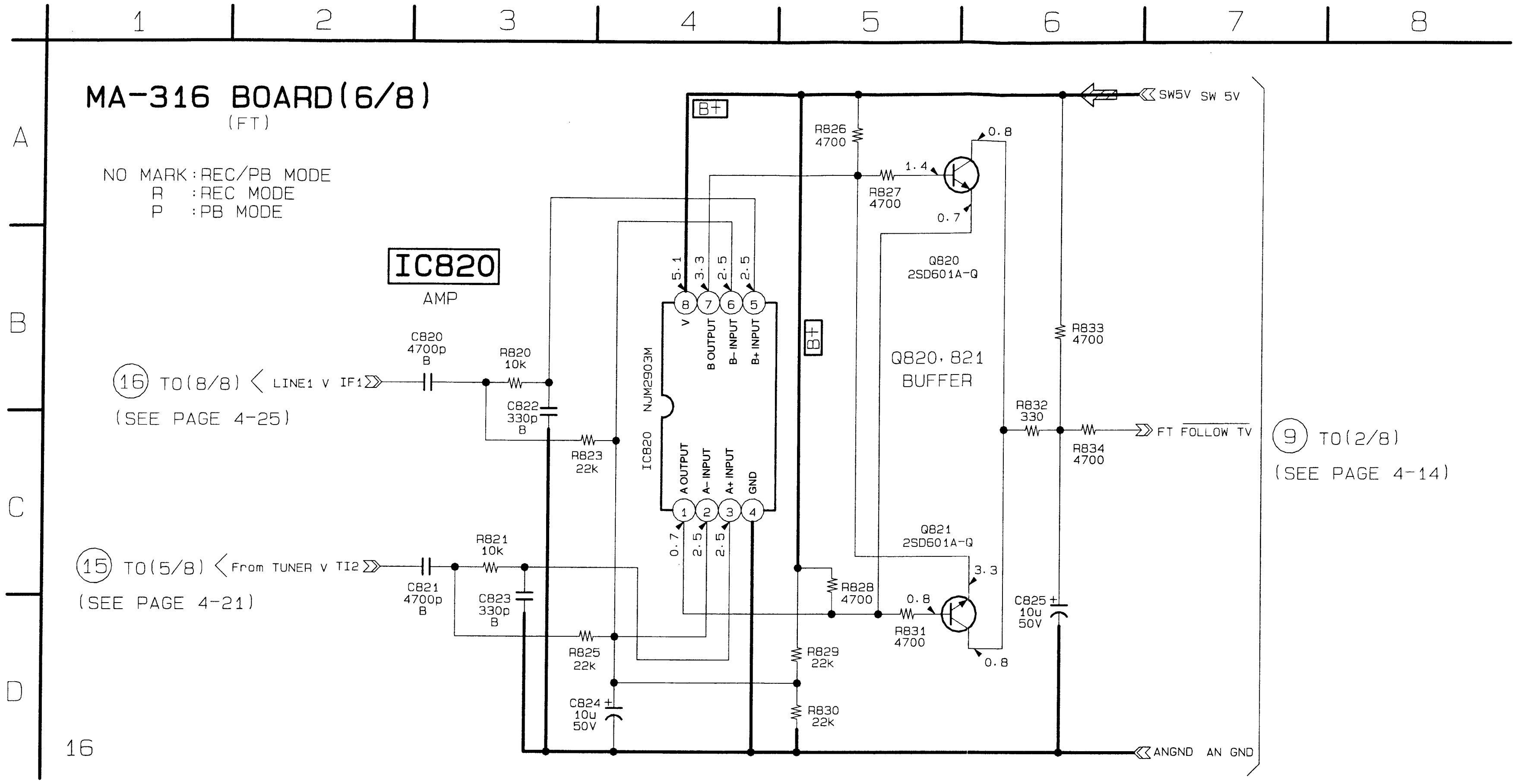
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡》	➡
PB			⇨》	⇨

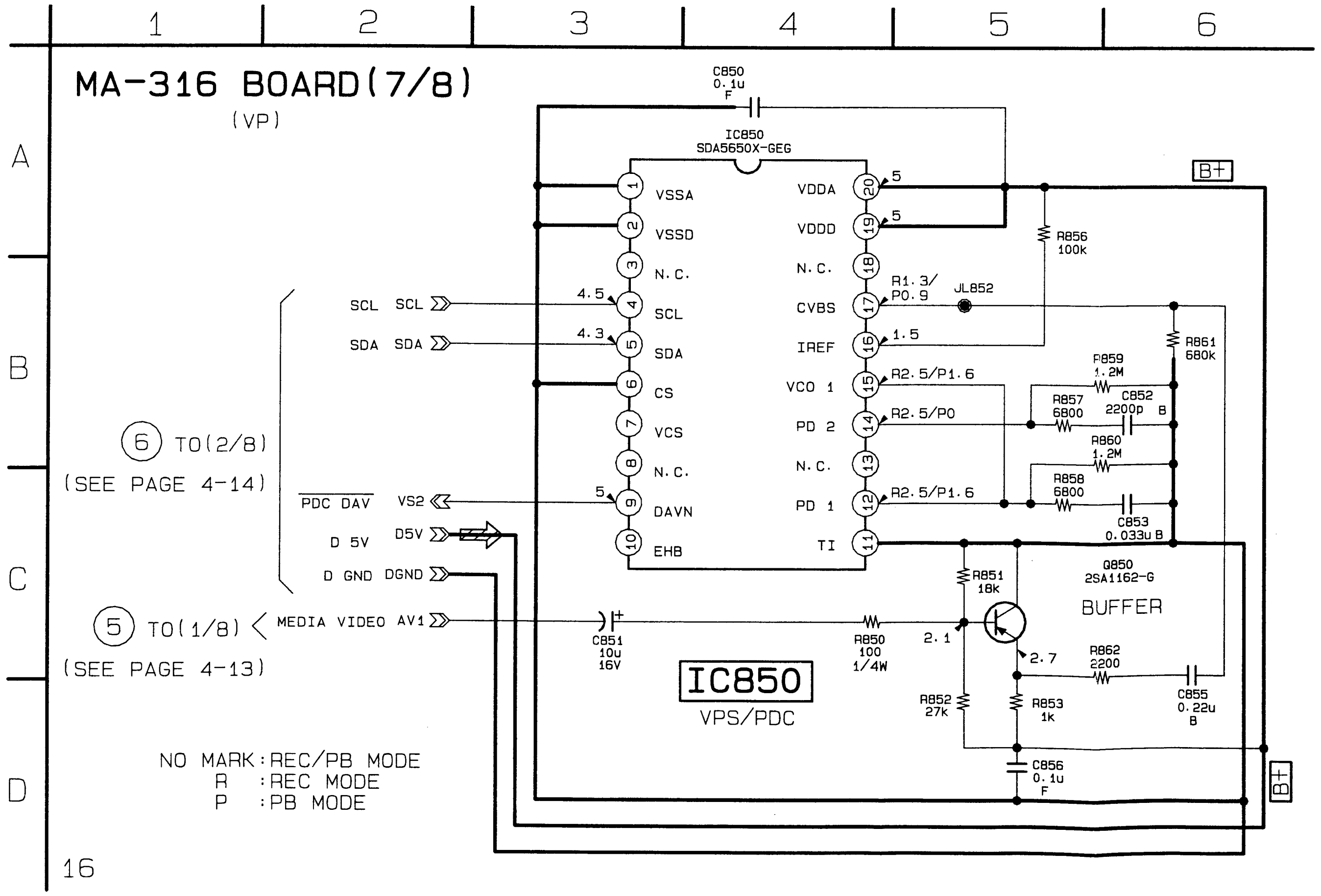
Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

MA-316 (FOLLOW TV, PDC, VPS) SCHEMATIC DIAGRAM

— Ref. No.: MA-316 Board; 2,000 Series —

- See page 4-9 for MA-316 BOARD printed wiring board.

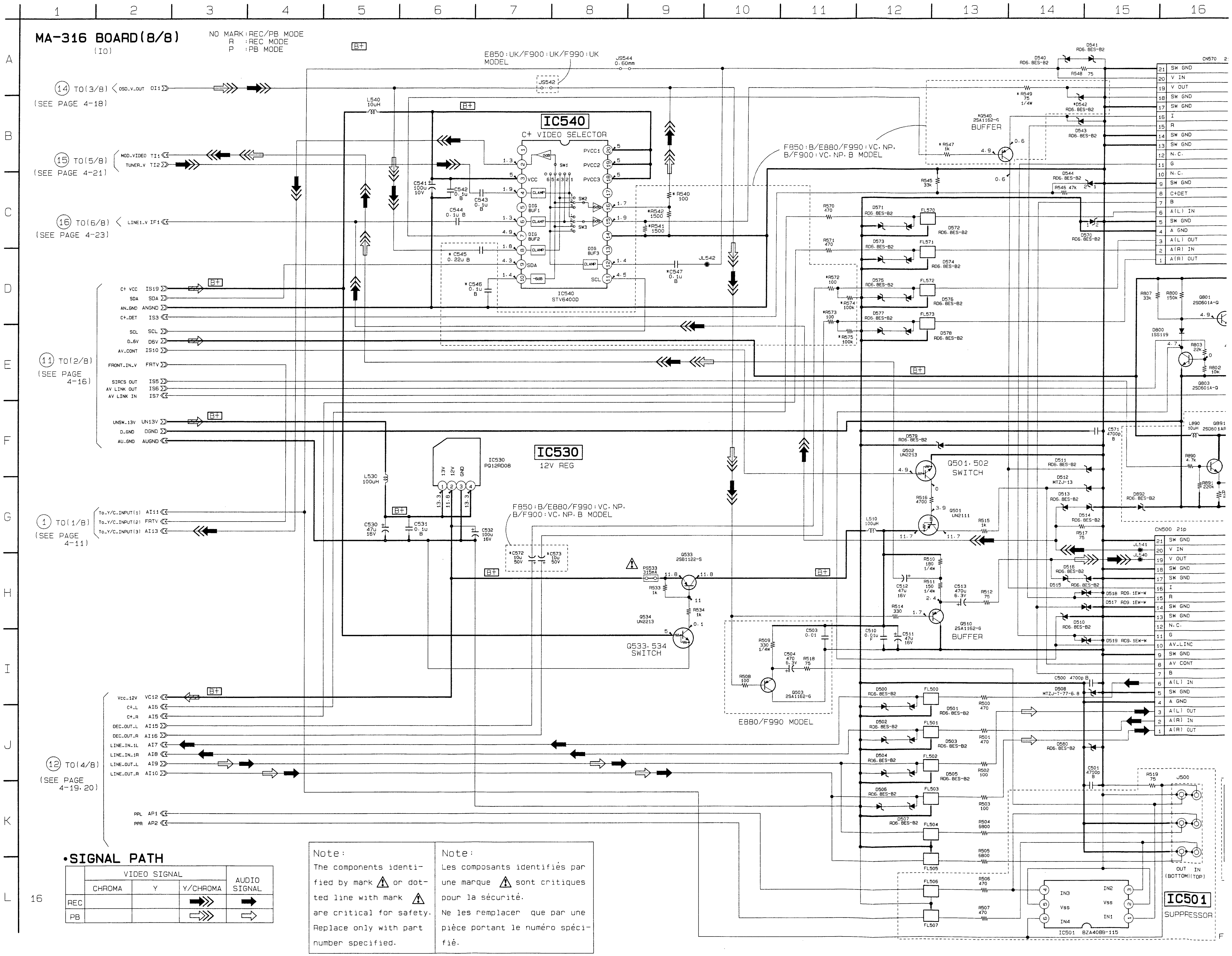

1
2
3
4
5
6
7
8
A
B
C
D
MA-316 BOARD(6/8)
(FT)
NO MARK : REC/PB MODE
R : REC MODE
P : PB MODE
IC820
AMP
IC820 NJM2903M
V
B OUTPUT
B- INPUT
B+ INPUT
A OUTPUT
A- INPUT
A+ INPUT
GND
5.1
3.3
2.5
2.5
0.7
2.5
2.5
B+
C820 4700p B
R820 10k
C822 330p B
R823 22k
16 TO(8/8) LINE1 V IF1
(SEE PAGE 4-25)
15 TO(5/8) From TUNER V TI2
(SEE PAGE 4-21)
R821 10k
C821 4700p B
C823 330p B
R825 22k
C824 10u 50V
R826 4700
R827 4700
1.4
0.8
0.7
Q820 2SD601A-Q
Q820, 821 BUFFER
R833 4700
R832 330
R834 4700
FT FOLLOW TV
9 TO(2/8)
(SEE PAGE 4-14)
Q821 2SD601A-Q
3.3
0.8
0.8
R828 4700
R831 4700
R829 22k
R830 22k
C825 10u 50V
SW5V SW 5V
ANGND AN GND
16


1
2
3
4
5
6
A
B
C
D
MA-316 BOARD(7/8)
(VP)
C850 0.1u F
IC850 SDA5650X-GEG
VSSA
VSSD
N.C.
SCL
SDA
CS
VCS
N.C.
DAVN
EHB
VDDA
VDDD
N.C.
CVBS
IREF
VCO 1
PD 2
N.C.
PD 1
TI
5
5
4.5
4.3
5
R1.3/P0.9
1.5
R2.5/P1.6
R2.5/P0
R2.5/P1.6
JL852
B+
R856 100k
R851 680k
R859 1.2M
R857 6800
C852 2200p B
R860 1.2M
R858 6800
C853 0.033u B
SCL SCL
SDA SDA
6 TO(2/8)
(SEE PAGE 4-14)
PDC DAV VS2
D 5V D5V
D GND DGND
5 TO(1/8) MEDIA VIDEO AV1
(SEE PAGE 4-13)
C851 10u 16V
R850 100 1/4W
IC850
VPS/PDC
R851 18k
Q850 2SA1162-G
BUFFER
2.1
2.7
R862 2200
C855 0.22u B
R852 27k
R853 1k
C856 0.1u F
NO MARK : REC/PB MODE
R : REC MODE
P : PB MODE
16

MA-316 (I/O) SCHEMATIC DIAGRAM

— Ref. No.: MA-316 Board; 2,000 Series —

- See page 4-9 for MA-316 BOARD printed wiring board.


MA-316 BOARD (8/8)
(IO)
NO MARK : REC/PB MODE
R : REC MODE
P : PB MODE
B+
(14) TO (3/8) OSD_V_OUT OI1
(SEE PAGE 4-18)
(15) TO (5/8) MOD_VIDEO TI1 TUNER_V TI2
(SEE PAGE 4-21)
(16) TO (6/8) LINE1_V IF1
(SEE PAGE 4-23)
(11) TO (2/8)
(SEE PAGE 4-16)
C+ VCC IS19
SDA SDA
AN_GND ANGND
C+_DET IS3
SCL SCL
D_6V D6V
AV_CONT IS10
FRONT_IN_V FRTV
SIRCS OUT IS5
AV LINK OUT IS6
AV LINK IN IS7
UNSW_13V UN13V
D_GND DGND
AU_GND AUGND
(1) TO (1/8)
(SEE PAGE 4-11)
TO_Y/C_INPUT(1) AI11
TO_Y/C_INPUT(2) FRTV
TO_Y/C_INPUT(3) AI13
(12) TO (4/8)
(SEE PAGE 4-19, 20)
VCC_12V VC12
C+_L AI6
C+_R AI5
DEC_OUT_L AI15
DEC_OUT_R AI16
LINE_IN_1L AI7
LINE_IN_1R AI8
LINE_OUT_L AI9
LINE_OUT_R AI10
PPL AP1
PPR AP2
E850 : UK/F900 : UK/F990 : UK MODEL
JS544 0.60mm
JS542
L540 10uH
IC540
C+ VIDEO SELECTOR
IC540 STV6400D
C541 100u 10V
C542 0.1u B
C543 0.1u B
C544 0.1u B
C545 0.22u B
C546 0.1u B
C547 0.1u B
R540 100
R541 1500
R542 1500
JL542
F850 : B/E880/F990 : VC, NP, B/F900 : VC, NP, B MODEL
Q540 2SA1162-G BUFFER
R547 1k
R545 33k
R549 75 1/4W
R548 75
R546 47k
D540 RD6.8ES-B2
D541 RD6.8ES-B2
D542 RD6.8ES-B2
D543 RD6.8ES-B2
D544 RD6.8ES-B2
D570 RD6.8ES-B2
D571 RD6.8ES-B2
D572 RD6.8ES-B2
D573 RD6.8ES-B2
D574 RD6.8ES-B2
D575 RD6.8ES-B2
D576 RD6.8ES-B2
D577 RD6.8ES-B2
D578 RD6.8ES-B2
FL570
FL571
FL572
FL573
R570 470
R571 470
R572 100
R573 100
R574 100k
R575 100k
CN570
IC530
IC530 PQ12RD08
12V REG
L530 100uH
C530 47u 16V
C531 0.1u B
C532 100u 16V
C572 10u 50V
C573 10u 50V
F850 : B/E880/F990 : VC, NP, B/F900 : VC, NP, B MODEL
PS533 315mA
Q533 2SB1122-S
R533 1k
R534 1k
Q534 UN2213
Q533, 534 SWITCH
E880/F990 MODEL
R508 100
R509 330 1/4W
C503 0.01
C504 470 6.3V
R518 75
Q503 2SA1162-G
Q501, 502 SWITCH
Q502 UN2213
Q501 UN2111
D579 RD6.8ES-B2
L510 10uH
R510 180 1/4W
R511 150 1/4W
R512 75
R514 330
R515 1k
R516 4700
R517 75
C510 0.01u
C511 47u 16V
C512 47u 16V
C513 470u 6.3V
Q510 2SA1162-G BUFFER
D510 RD6.8ES-B2
D511 RD6.8ES-B2
D512 MTZJ-13
D513 RD6.8ES-B2
D514 RD6.8ES-B2
D515 RD6.8ES-B2
D516 RD6.8ES-B2
D517 RD9.1EW-W
D518 RD5.1EW-W
D519 RD9.1EW-W
JL540
JL541
CN500 21P
C500 4700p B
C501 4700p B
D508 MTZJ-T-77-6.8
D500 RD6.8ES-B2
D501 RD6.8ES-B2
D502 RD6.8ES-B2
D503 RD6.8ES-B2
D504 RD6.8ES-B2
D505 RD6.8ES-B2
D506 RD6.8ES-B2
D507 RD6.8ES-B2
D580 RD6.8ES-B2
FL500
FL501
FL502
FL503
FL504
FL505
FL506
FL507
R500 470
R501 470
R502 100
R503 100
R504 6800
R505 6800
R506 470
R507 470
R519 75
J500
OUT IN
(BOTTOM) (TOP)
IC501
SUPPRESSOR
IC501 BZA408B-115
IN1 IN2 IN3 IN4 Vss
C571 4700p B
R807 33k
R800 150k
Q801 2SD601A-Q
D800 1SS119
R803 22k
R802 10k
Q803 2SD601A-Q
L890 10uH
Q891 2SD601AR
R890 4.7k
R891 220k
D892 RD6.8ES-B2
SW GND
V IN
V OUT
I
R
N.C.
G
C+DET
B
A(L) IN
A GND
A(L) OUT
A(R) IN
A(R) OUT
AV_LINC
AV CONT
16
A B C D E F G H I J K L
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

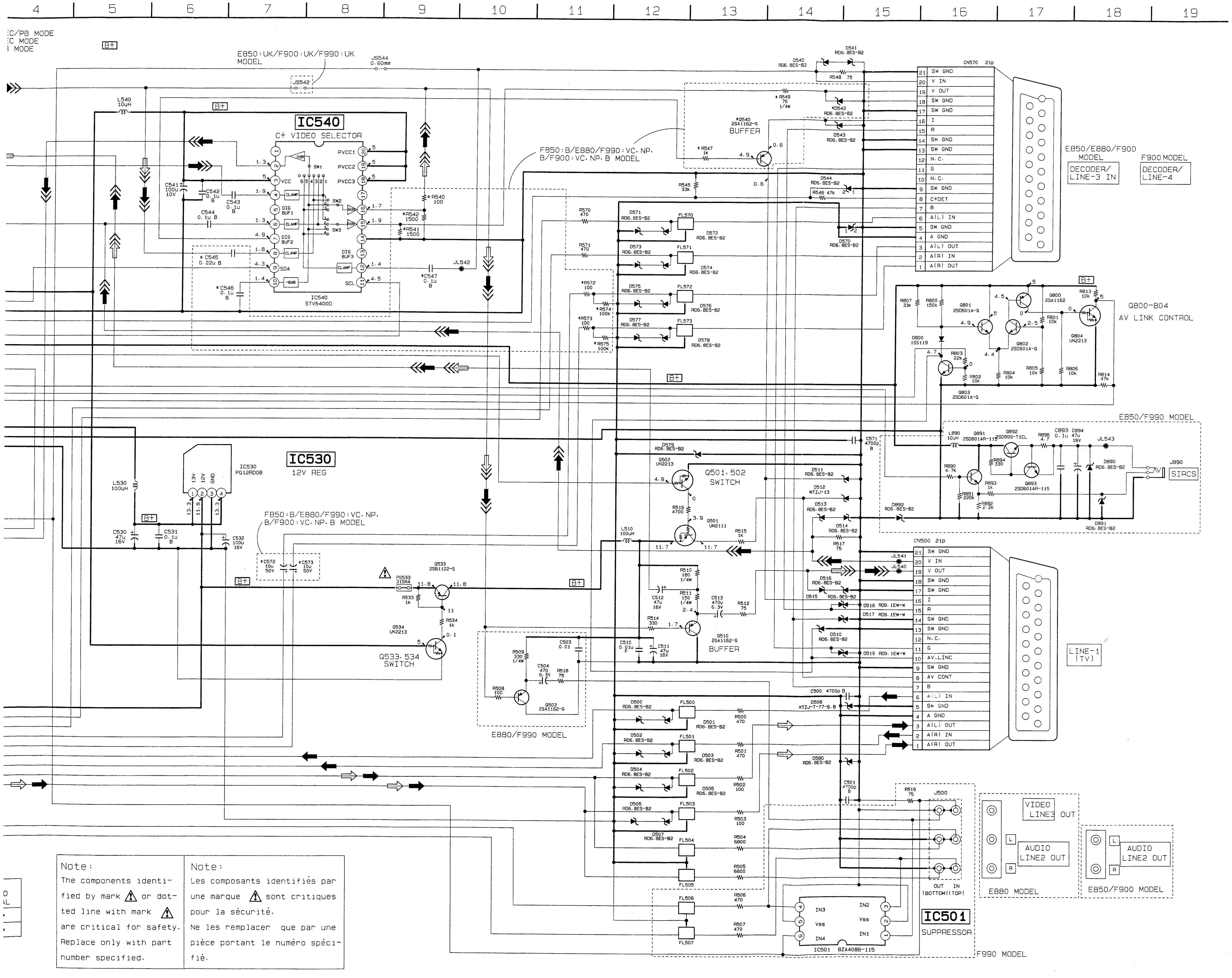
•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡»	➡
PB			⇨»	⇨

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

board.


4
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14
15
16
17
18
19
C/PB MODE
C MODE
MODE
B+
E850 : UK/F900 : UK/F990 : UK MODEL
JS544 0.60mm
JS542
L540 10uH
IC540
C+ VIDEO SELECTOR
IC540 STV6400D
F850 : B/E880/F990 : VC, NP, B/F900 : VC, NP, B MODEL
Q540 2SA1162-G BUFFER
CN570 21p
E850/E880/F900 MODEL
DECODER/ LINE-3 IN
F900 MODEL
DECODER/ LINE-4
Q800-804
AV LINK CONTROL
E850/F990 MODEL
J890
SIRCS
IC530 PQ12RD08
IC530
12V REG
L530 100uH
Q501, 502 SWITCH
Q510 2SA1162-G BUFFER
Q533, 534 SWITCH
PS533 315mA
E880/F990 MODEL
CN500 21p
LINE-1 (TV)
J500
OUT IN (BOTTOM)(TOP)
VIDEO LINE3 OUT
AUDIO LINE2 OUT
E880 MODEL
E850/F900 MODEL
IC501
SUPPRESSOR
IC501 BZA408B-115
F990 MODEL

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

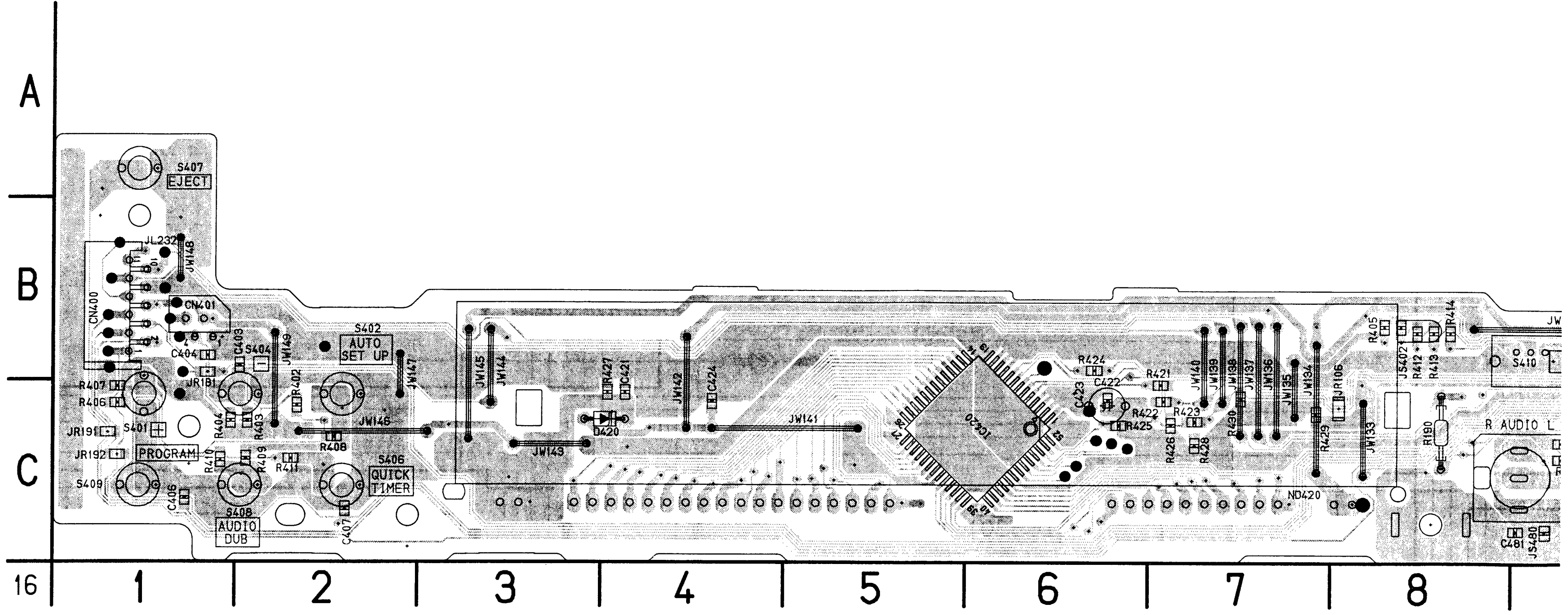
Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

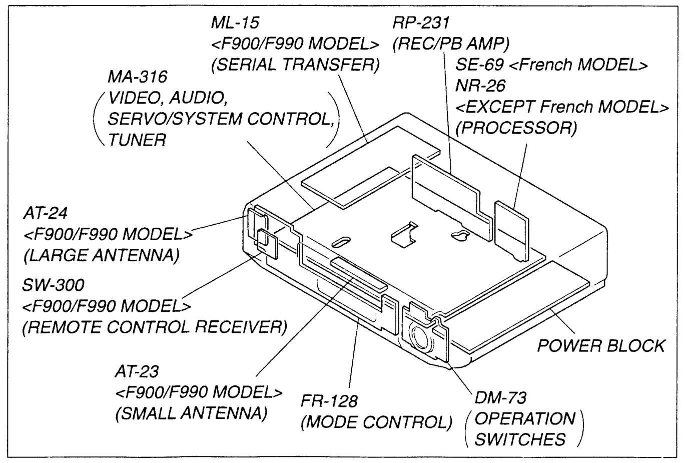
FR-128 (MODE CONTROL) PRINTED WIRING BOARD

— Ref. No.: FR-128 Board; 3,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

FR-128 BOARD (CONDUCTOR SIDE)


A
B
C
16
1
2
3
4
5
6
7
8
S407
EJECT
S402
AUTO SET UP
S401
PROGRAM
S406
QUICK TIMER
S408
AUDIO DUB
S409
S404
S410
CN400
CN401
IC420
D420
ND420
JW141
JW142
JW143
JW144
JW145
JW146
JW147
JW148
JW149
R AUDIO L
C481
JS480

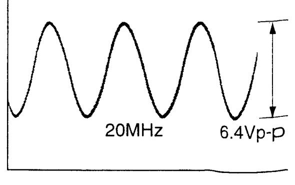

ML-15
<F900/F990 MODEL>
(SERIAL TRANSFER)
RP-231
(REC/PB AMP)
SE-69 <French MODEL>
NR-26
<EXCEPT French MODEL>
(PROCESSOR)
MA-316
(VIDEO, AUDIO, SERVO/SYSTEM CONTROL, TUNER)
AT-24
<F900/F990 MODEL>
(LARGE ANTENNA)
SW-300
<F900/F990 MODEL>
(REMOTE CONTROL RECEIVER)
AT-23
<F900/F990 MODEL>
(SMALL ANTENNA)
FR-128
(MODE CONTROL)
DM-73
(OPERATION SWITCHES)
POWER BLOCK

FR-128 BOARD

CN181	A-12	D491	C-10
CN400	B-1		
CN480	C-12	IC180	B-12
		IC182	B-13
D186	B-13	IC183	A-11
D187	A-13	IC400	B-13
D400	A-13	IC420	C-6
D420	C-4		
D480	C-9	J480	C-9
D481	C-10		
D490	C-11	Q400	A-13

FR-128 BOARD

① IC180 ㊷ E-E

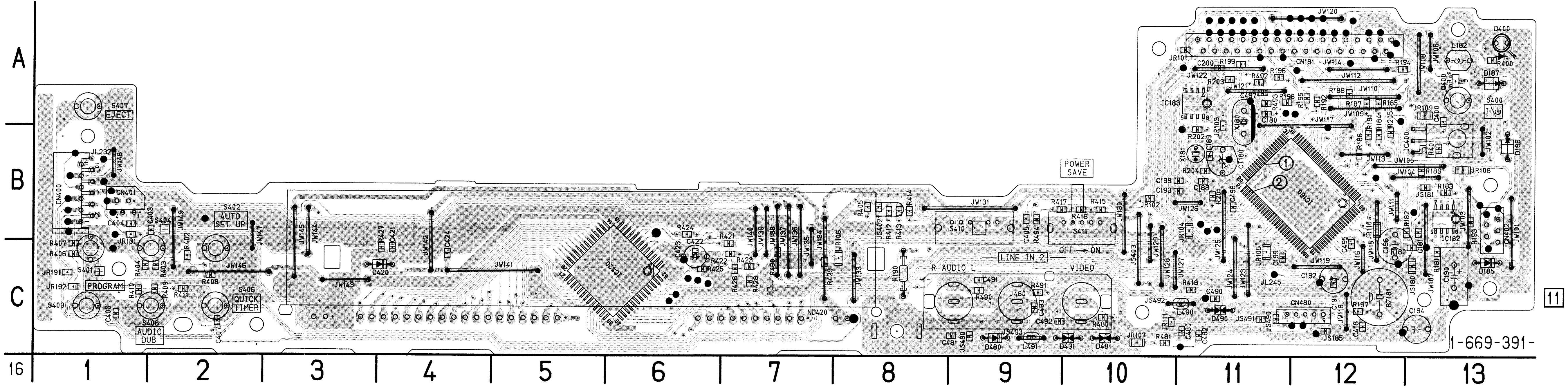


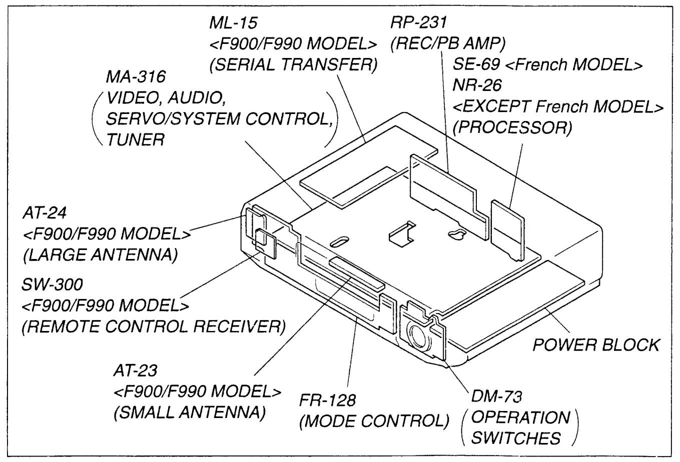
FR-128 (MODE CONTROL) PRINTED WIRING BOARD

— Ref. No.: FR-128 Board; 3,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

FR-128 BOARD (CONDUCTOR SIDE)

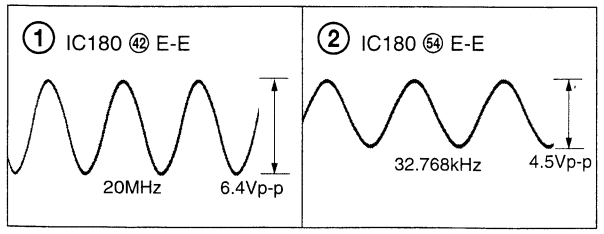

A
B
C
16
1
2
3
4
5
6
7
8
9
10
11
12
13
11
1-669-391-
S407 EJECT
S402 AUTO SET UP
S401 PROGRAM
S408 AUDIO DUB
S406 QUICK TIMER
S409
CN400
CN401
CN181
CN480
IC420
IC180
IC182
IC183
IC400
D420
D480
D481
D490
D491
D400
D186
D187
D185
Q400
J480
X180
X181
L182
S400
S410
S411
POWER SAVE
LINE IN 2
R AUDIO L
VIDEO
OFF → ON
ND420
JW120
JW141
JW143
JW146
①
②


ML-15
<F900/F990 MODEL>
(SERIAL TRANSFER)
RP-231
(REC/PB AMP)
SE-69 <French MODEL>
NR-26
<EXCEPT French MODEL>
(PROCESSOR)
MA-316
(VIDEO, AUDIO, SERVO/SYSTEM CONTROL, TUNER)
AT-24
<F900/F990 MODEL>
(LARGE ANTENNA)
SW-300
<F900/F990 MODEL>
(REMOTE CONTROL RECEIVER)
AT-23
<F900/F990 MODEL>
(SMALL ANTENNA)
FR-128
(MODE CONTROL)
DM-73
(OPERATION SWITCHES)
POWER BLOCK

FR-128 BOARD

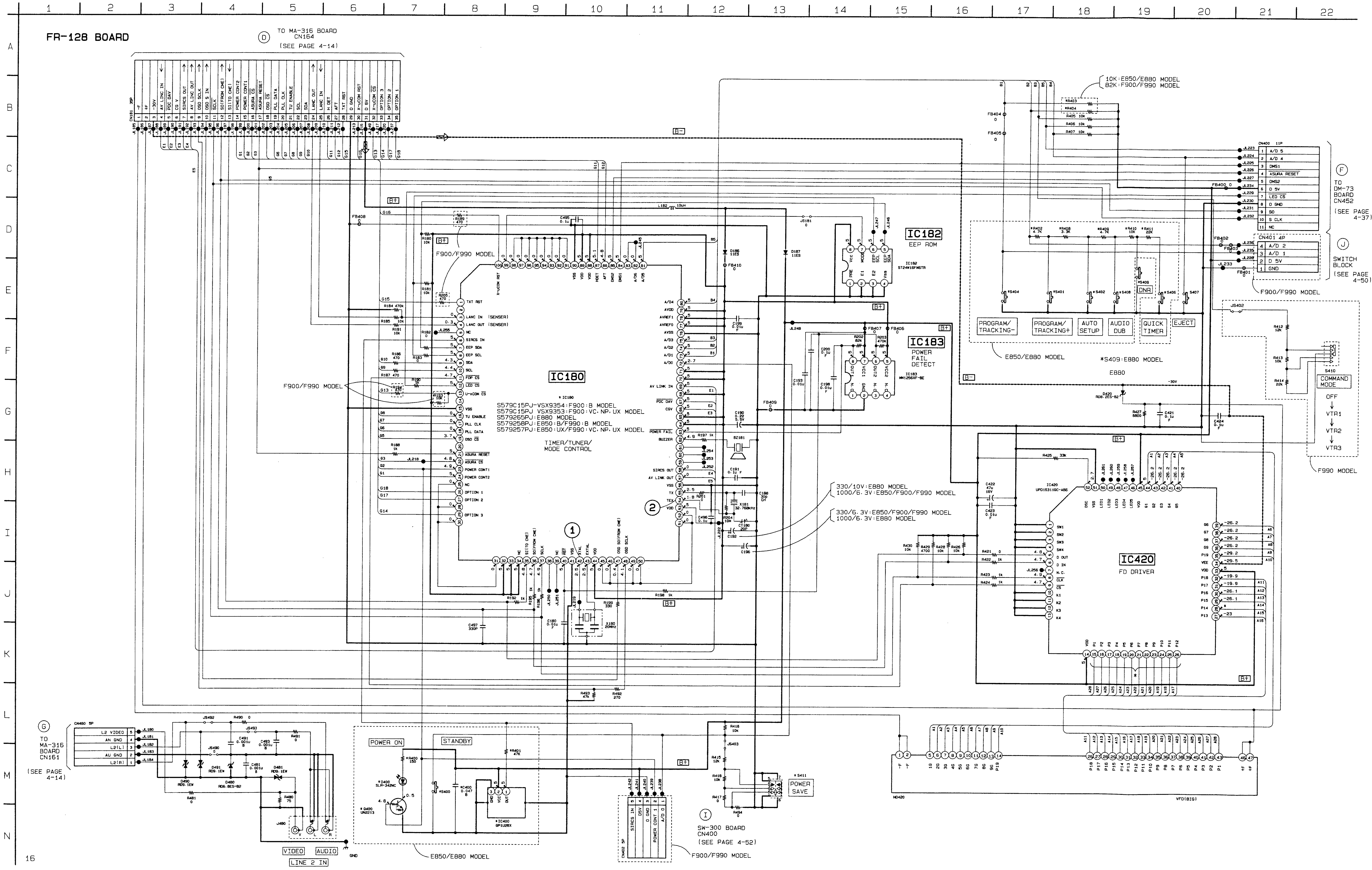
CN181	A-12	D491	C-10
CN400	B-1		
CN480	C-12	IC180	B-12
		IC182	B-13
D186	B-13	IC183	A-11
D187	A-13	IC400	B-13
D400	A-13	IC420	C-6
D420	C-4		
D480	C-9	J480	C-9
D481	C-10		
D490	C-11	Q400	A-13

FR-128 BOARD



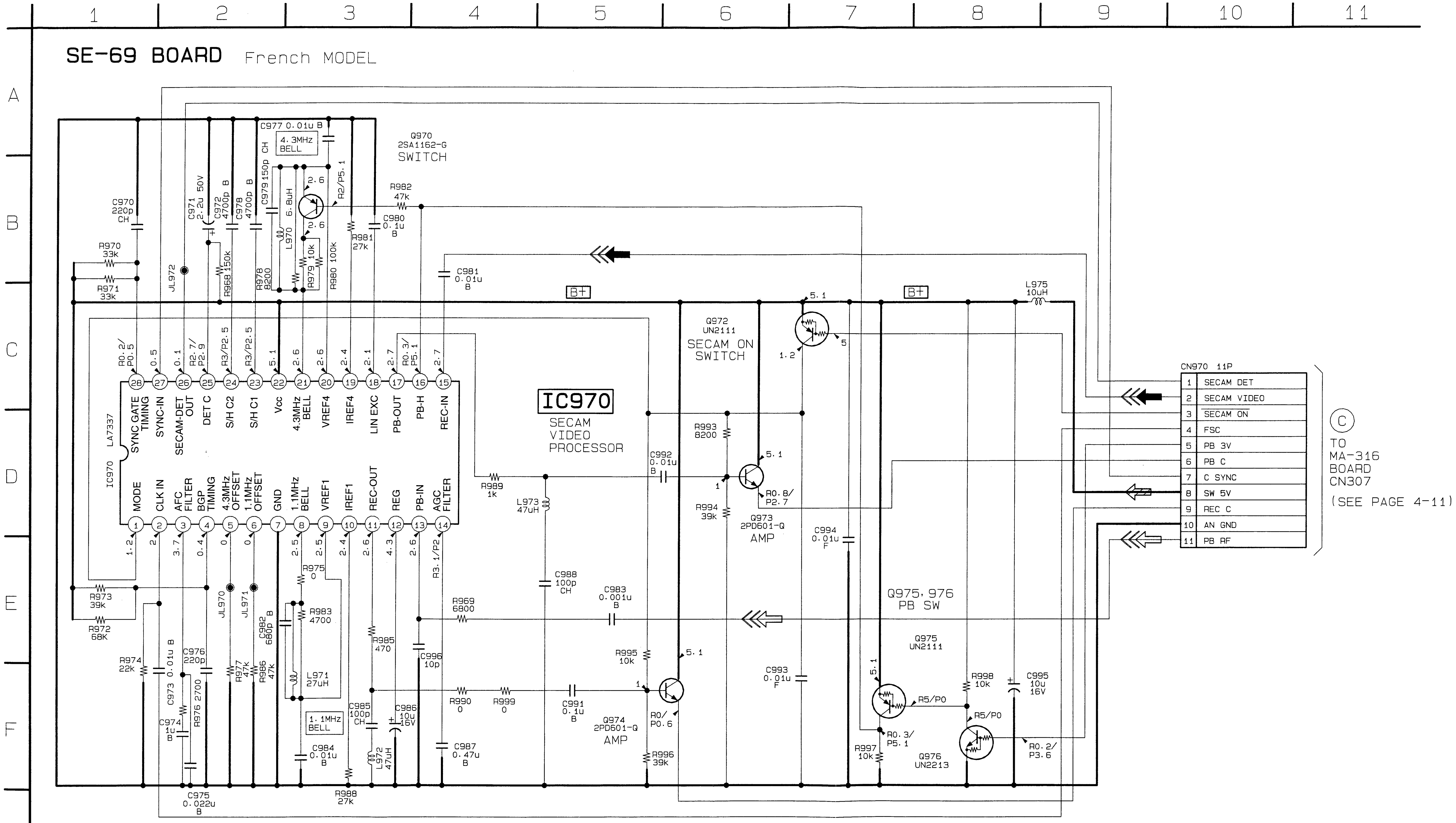
FR-128 (MODE CONTROL) SCHEMATIC DIAGRAM

— Ref. No.: FR-128 Board; 3,000 Series —


FR-128 BOARD
Ⓓ TO MA-316 BOARD CN164 (SEE PAGE 4-14)
IC180
TIMER/TUNER/MODE CONTROL
* IC180
S579C15PJ-VSX9354 : F900 : B MODEL
S579C15PJ VSX9353 : F900 : VC, NP, UX MODEL
S579265PJ : E880 MODEL
S579258PJ : E850 : B/F990 : B MODEL
S579257PJ : E850 : UX/F990 : VC, NP, UX MODEL
F900/F990 MODEL
IC182
EEP ROM
IC183
POWER FAIL DETECT
IC420
FD DRIVER
10K : E850/E880 MODEL
82K : F900/F990 MODEL
Ⓕ TO OM-73 BOARD CN452 (SEE PAGE 4-37)
Ⓙ SWITCH BLOCK (SEE PAGE 4-50)
PROGRAM/TRACKING−
PROGRAM/TRACKING+
AUTO SETUP
AUDIO DUB
QUICK TIMER
EJECT
DNR
E850/E880 MODEL
*S409 : E880 MODEL
E880
S410 COMMAND MODE
OFF
VTR1
VTR2
VTR3
F990 MODEL
330/10V : E880 MODEL
1000/6.3V : E850/F900/F990 MODEL
330/6.3V : E850/F900/F990 MODEL
1000/6.3V : E880 MODEL
Ⓖ TO MA-316 BOARD CN161 (SEE PAGE 4-14)
POWER ON
STANDBY
VIDEO
AUDIO
LINE 2 IN
E850/E880 MODEL
POWER SAVE
Ⓘ SW-300 BOARD CN400 (SEE PAGE 4-52)
F900/F990 MODEL
VFD(BIG)
16

SE-69 (SECAM VIDEO SIGNAL PROCESS) SCHEMATIC DIAGRAM

— Ref. No.: SE-69 Board; 2,000 Series —


1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
SE-69 BOARD French MODEL
IC970 SECAM VIDEO PROCESSOR
IC970 LA7337
SYNC GATE TIMING
SYNC-IN
SECAM-DET OUT
DET C
S/H C2
S/H C1
Vcc
4.3MHz BELL
VREF4
IREF4
LIN EXC
PB-OUT
PB-H
REC-IN
MODE
CLK IN
AFC FILTER
BGP TIMING
4.3MHz OFFSET
1.1MHz OFFSET
GND
1.1MHz BELL
VREF1
IREF1
REC-OUT
REG
PB-IN
AGC FILTER
Q970 2SA1162-G SWITCH
Q972 UN2111 SECAM ON SWITCH
Q973 2PD601-Q AMP
Q974 2PD601-Q AMP
Q975, 976 PB SW
Q975 UN2111
Q976 UN2213
C977 0.01u B
4.3MHz BELL
1.1MHz BELL
C970 220p CH
R970 33k
R971 33k
R972 68K
R973 39k
R974 22k
C971 2.2u 50V
C972 4700p B
C978 4700p B
C979 150p CH
L970 6.8uH
R979 10k
R980 100k
R981 27k
R982 47k
C980 0.1u B
C981 0.01u B
R968 150k
R978 8200
JL972
JL970
JL971
C973 0.01u B
C974 1u B
C975 0.022u B
C976 220p
R976 2700
R977 47k
R986 47k
C982 680p B
R975 0
R983 4700
L971 27uH
R985 470
C984 0.01u B
C985 100p CH
C986 10u 16V
L972 47uH
C987 0.47u B
R988 27k
C996 10p
R969 6800
R989 1k
L973 47uH
C988 100p CH
C983 0.001u B
R990 0
R999 0
C991 0.1u B
R995 10k
R996 39k
C992 0.01u B
R993 8200
R994 39k
C994 0.01u F
C993 0.01u F
R997 10k
R998 10k
C995 10u 16V
L975 10uH
B+
CN970 11P
1 SECAM DET
2 SECAM VIDEO
3 SECAM ON
4 FSC
5 PB 3V
6 PB C
7 C SYNC
8 SW 5V
9 REC C
10 AN GND
11 PB RF
C
TO MA-316 BOARD CN307
(SEE PAGE 4-11)
16

NO MARK : REC/PB MODE
R : REC MODE
P : PB MODE

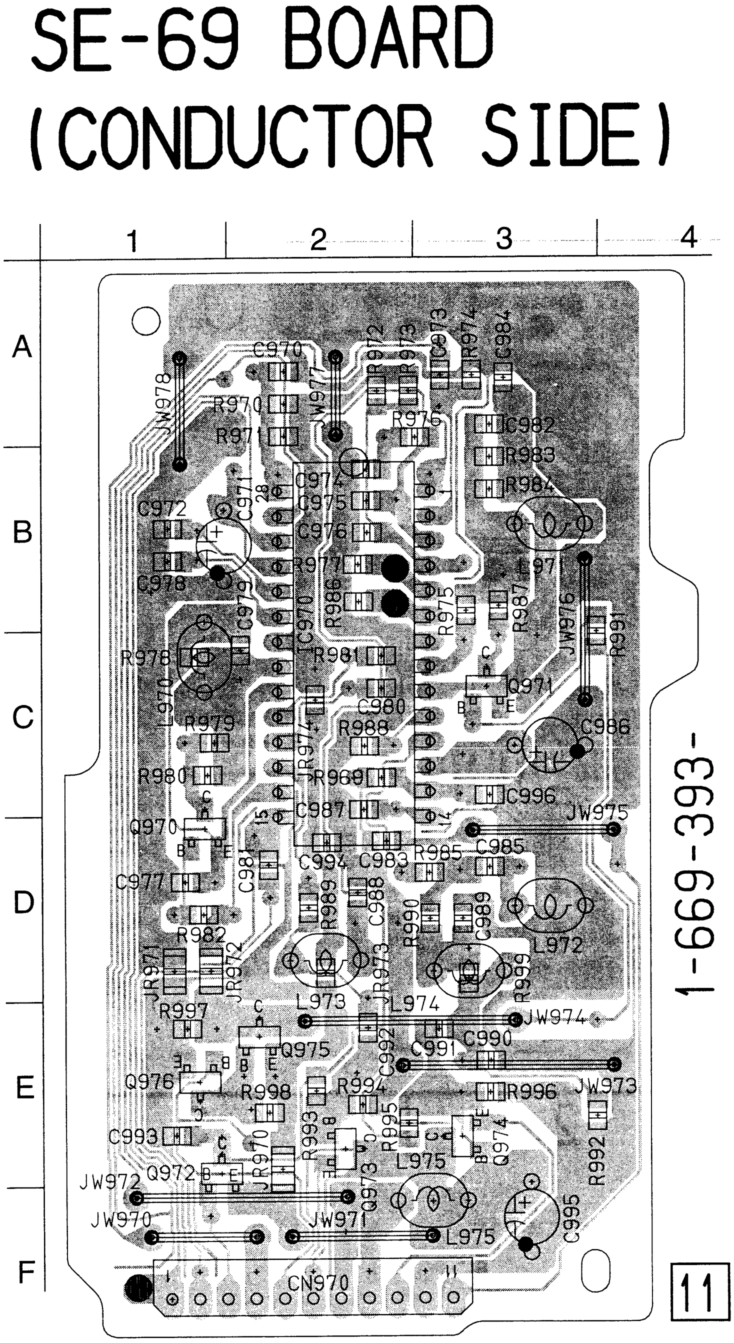
•SIGNAL PATH

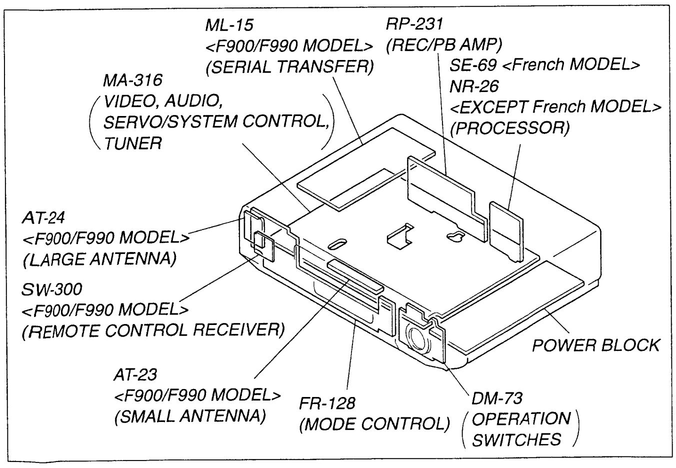
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡≫	
PB			⇨≫	

SE-69 (SECAM VIDEO SIGNAL PROCESS) PRINTED WIRING BOARD

— Ref. No.: SE-69 Board; 2,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.


SE-69 BOARD
(CONDUCTOR SIDE)
1
2
3
4
A
B
C
D
E
F
C970
R970
R971
JW978
JW977
R972
R973
C973
R974
C984
R976
C982
R983
R984
C971
C972
C974
C975
C976
C978
R977
L971
C979
R986
R975
R987
JW976
R991
R978
L970
IC970
R981
Q971
C980
C986
R979
R988
R980
JR974
R969
C996
JW975
Q970
C987
C981
C994
C983
R985
C985
C977
R989
C988
R990
C989
L972
R982
JR971
JR972
L973
JR973
L974
R999
R997
JW974
Q975
C992
C991
C990
Q976
R998
R994
R996
JW973
R993
R995
Q974
R992
C993
JR970
Q973
L975
C995
JW972
Q972
JW970
JW971
CN970
1-669-393-
11

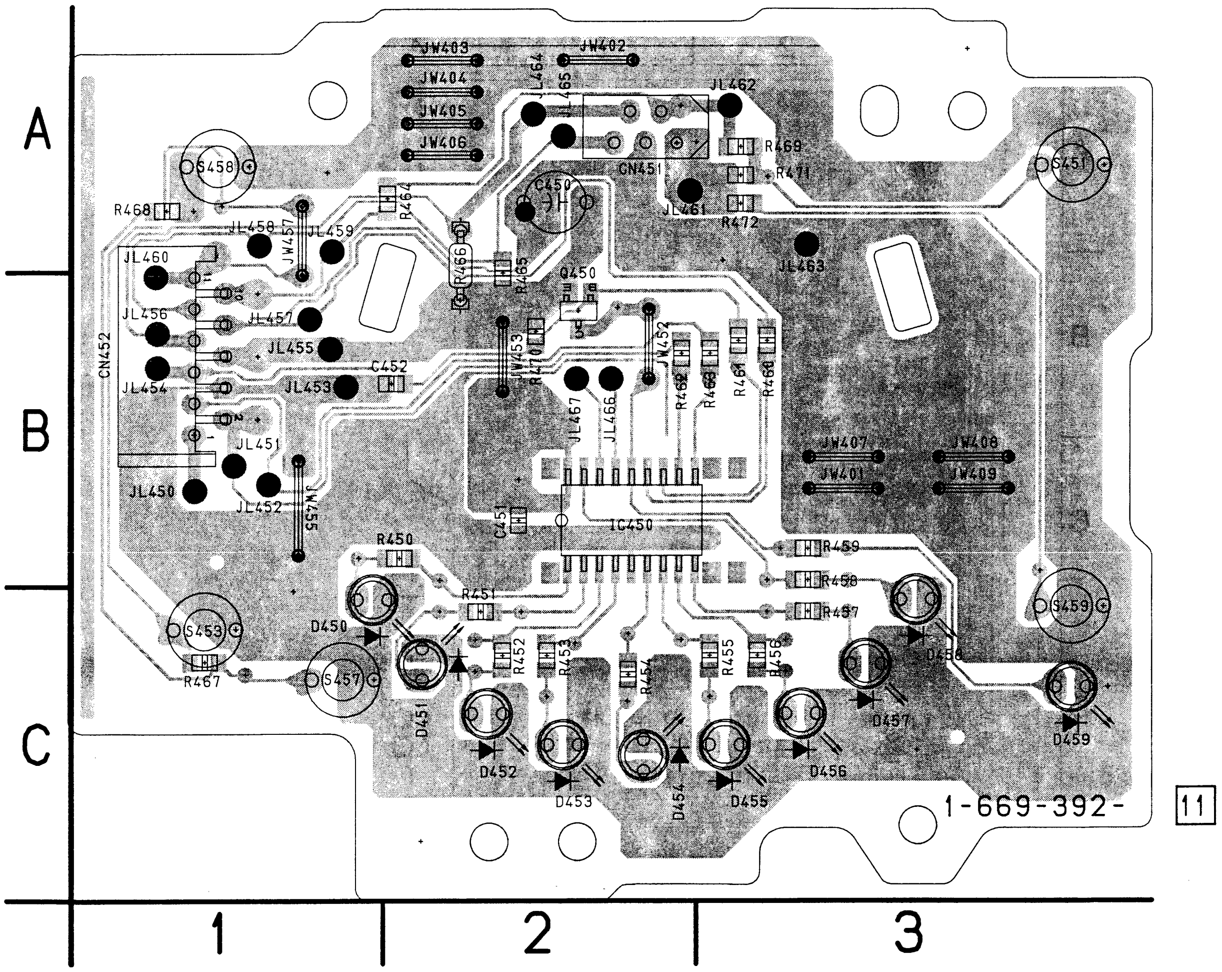

ML-15
<F900/F990 MODEL>
(SERIAL TRANSFER)
RP-231
(REC/PB AMP)
SE-69 <French MODEL>
NR-26
<EXCEPT French MODEL>
(PROCESSOR)
MA-316
VIDEO, AUDIO,
SERVO/SYSTEM CONTROL,
TUNER
AT-24
<F900/F990 MODEL>
(LARGE ANTENNA)
SW-300
<F900/F990 MODEL>
(REMOTE CONTROL RECEIVER)
POWER BLOCK
AT-23
<F900/F990 MODEL>
(SMALL ANTENNA)
FR-128
(MODE CONTROL)
DM-73
(OPERATION SWITCHES)

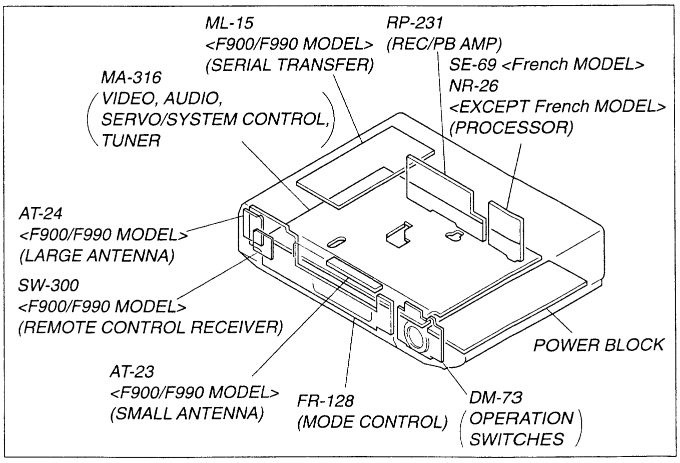
DM-73 (OPERATION SWITCHES) PRINTED WIRING BOARD

— Ref. No.: DM-73 Board; 2,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

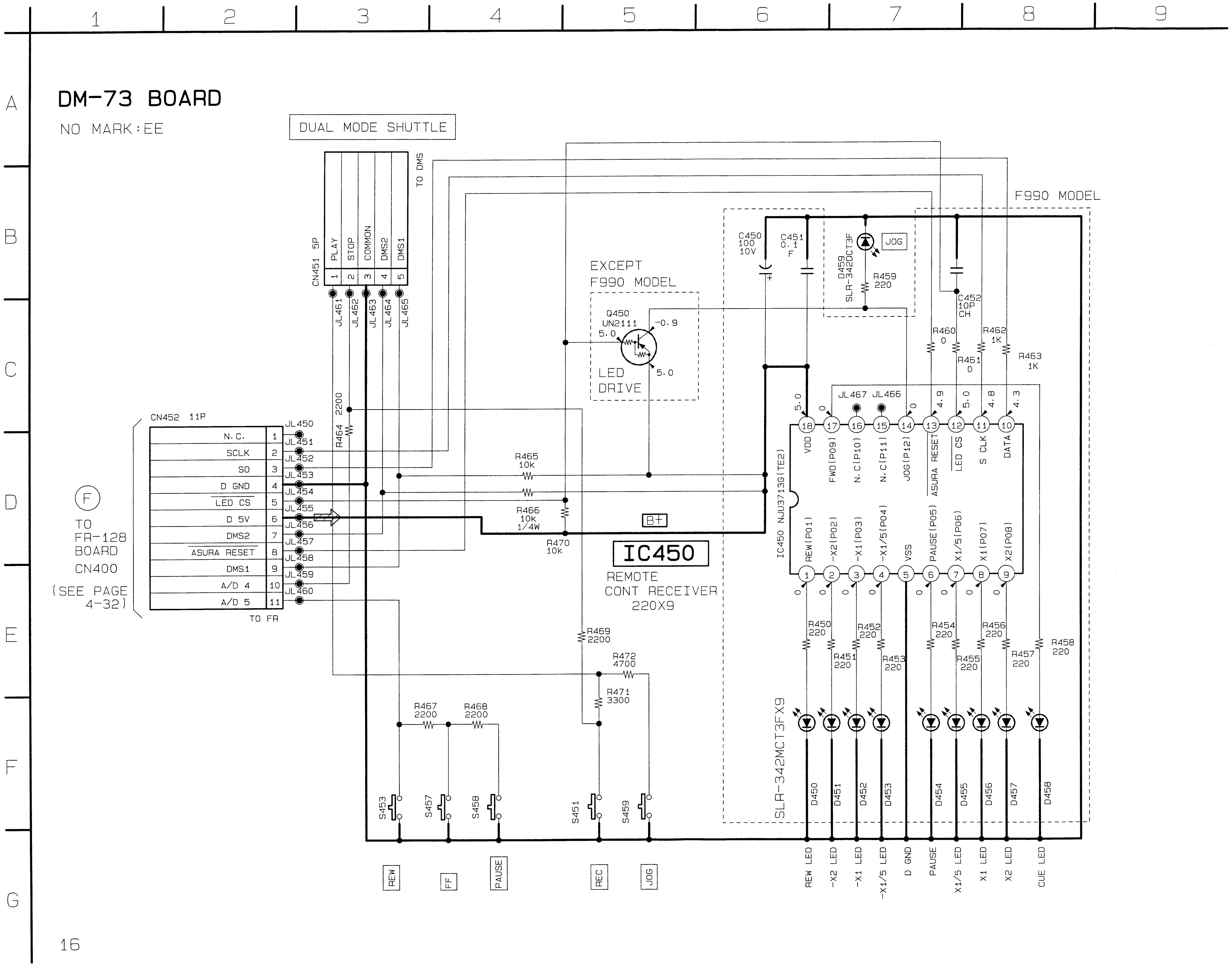
DM-73 BOARD (CONDUCTOR SID)


A
B
C
1
2
3
JW403
JW402
JW404
JW405
JW406
JL464
JL465
JL462
CN451
R469
R471
R472
JL461
JL463
C450
S458
S451
R468
R464
JL458
JW457
JL459
JL460
R466
R465
Q450
JL456
JL457
JL455
CN452
C452
JW453
R470
JW452
R462
R463
R461
R460
JL454
JL453
JL467
JL466
JW407
JW408
JW401
JW409
JL451
JL450
JL452
JW455
C451
IC450
R450
R459
R458
R457
R451
D450
S453
S459
R452
R453
R454
R455
R456
D458
R467
S457
D451
D457
D459
D452
D453
D454
D455
D456
1-669-392-
11


ML-15
<F900/F990 MODEL>
(SERIAL TRANSFER)
RP-231
(REC/PB AMP)
SE-69 <French MODEL>
NR-26
<EXCEPT French MODEL>
(PROCESSOR)
MA-316
VIDEO, AUDIO,
SERVO/SYSTEM CONTROL,
TUNER
AT-24
<F900/F990 MODEL>
(LARGE ANTENNA)
SW-300
<F900/F990 MODEL>
(REMOTE CONTROL RECEIVER)
POWER BLOCK
AT-23
<F900/F990 MODEL>
(SMALL ANTENNA)
FR-128
(MODE CONTROL)
DM-73
OPERATION
SWITCHES

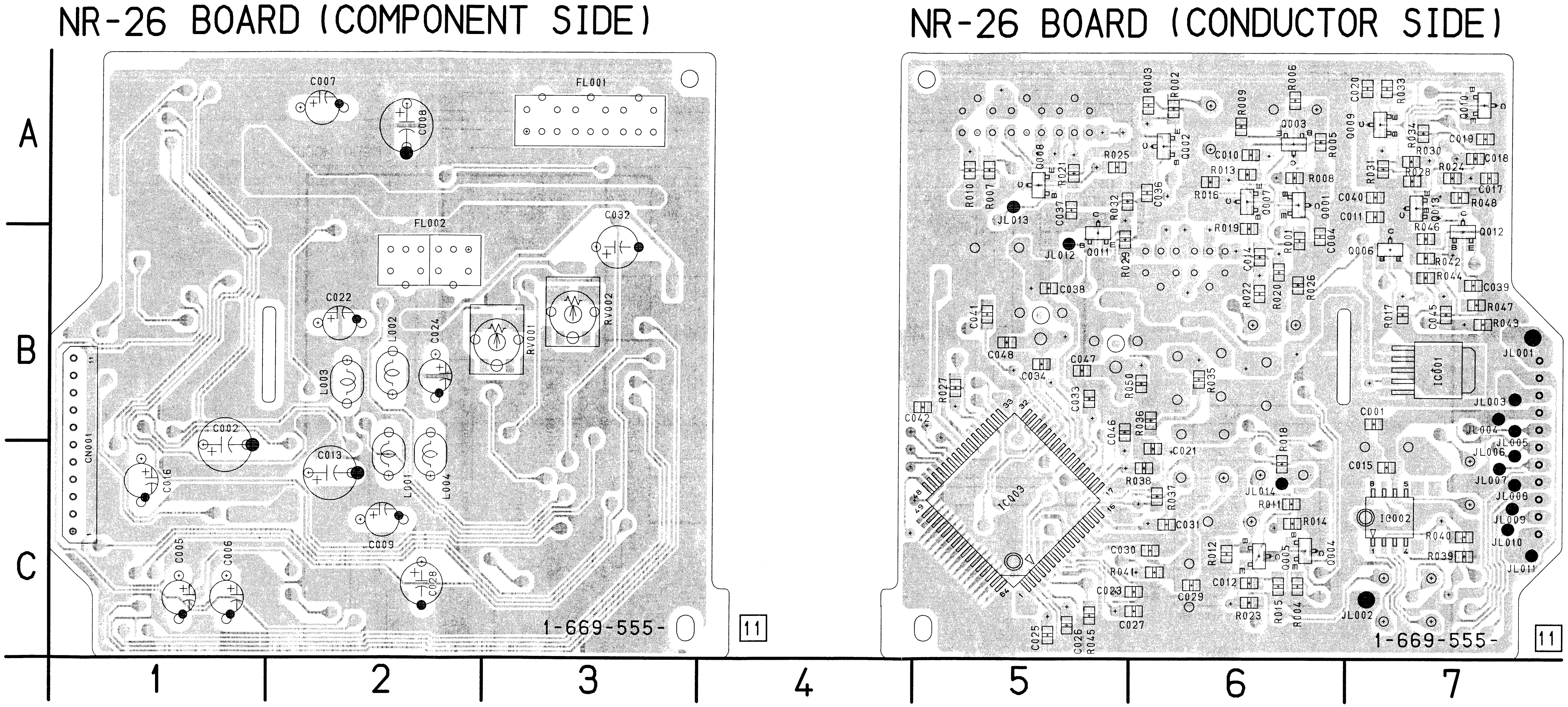
DM-73 (OPERATION SWITCHES) SCHEMATIC DIAGRAM

— Ref. No.: DM-73 Board; 2,000 Series —


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
DM-73 BOARD
NO MARK : EE
DUAL MODE SHUTTLE
TO DMS
CN451 5P
1 PLAY
2 STOP
3 COMMON
4 DMS2
5 DMS1
JL461
JL462
JL463
JL464
JL465
R464 2200
CN452 11P
1 N.C.
2 SCLK
3 SO
4 D GND
5 LED CS
6 D 5V
7 DMS2
8 ASURA RESET
9 DMS1
10 A/D 4
11 A/D 5
JL450
JL451
JL452
JL453
JL454
JL455
JL456
JL457
JL458
JL459
JL460
TO FR
F
TO FR-128 BOARD CN400
(SEE PAGE 4-32)
R465 10k
R466 10k 1/4W
R470 10k
B+
EXCEPT F990 MODEL
Q450 UN2111
5.0
-0.9
5.0
LED DRIVE
IC450
REMOTE CONT RECEIVER 220X9
F990 MODEL
C450 100 10V
C451 0.1 F
D459 SLR-342DCT3F
JOG
R459 220
C452 10P CH
R460 0
R461 0
R462 1K
R463 1K
JL467
JL466
IC450 NJU3713G(TE2)
18 VDD
17 FWD(P09)
16 N.C(P10)
15 N.C(P11)
14 JOG(P12)
13 ASURA RESET
12 LED CS
11 S CLK
10 DATA
1 REW(P01)
2 -X2(P02)
3 -X1(P03)
4 -X1/5(P04)
5 VSS
6 PAUSE(P05)
7 X1/5(P06)
8 X1(P07)
9 X2(P08)
5.0
0
0
4.9
5.0
4.8
4.3
R450 220
R451 220
R452 220
R453 220
R454 220
R455 220
R456 220
R457 220
R458 220
R469 2200
R472 4700
R471 3300
R467 2200
R468 2200
SLR-342MCT3FX9
D450
D451
D452
D453
D454
D455
D456
D457
D458
S453
S457
S458
S451
S459
REW
FF
PAUSE
REC
JOG
REW LED
-X2 LED
-X1 LED
-X1/5 LED
D GND
PAUSE
X1/5 LED
X1 LED
X2 LED
CUE LED
16

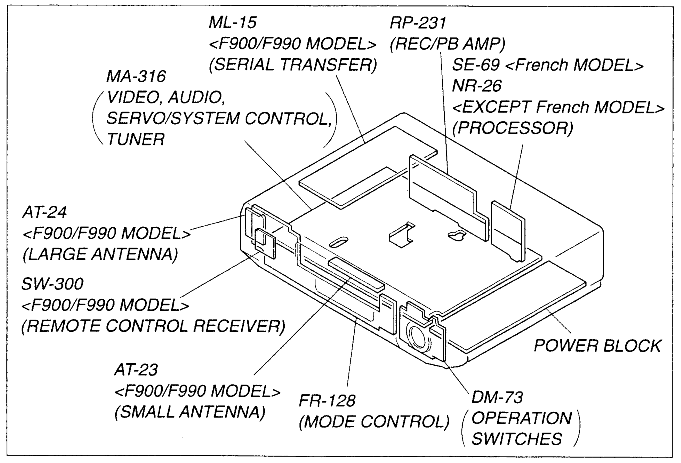
NR-26 (DNR PROCESSOR) PRINTED WIRING BOARD
— Ref. No.: NR-26 Board; 6,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.


NR-26 BOARD (COMPONENT SIDE)
NR-26 BOARD (CONDUCTOR SIDE)
A
B
C
1
2
3
4
5
6
7
C007
FL001
C008
FL002
C032
C022
L002
C024
RV001
RV002
L003
CN001
C002
C013
L001
L004
C016
C009
C005
C006
C028
1-669-555-
11
R003
R002
R006
C020
R033
Q010
R009
Q003
Q009
R005
R034
C019
R030
C018
Q008
R025
Q002
C010
R013
R008
R031
R028
R024
C017
R010
R007
R021
R032
C036
R016
Q007
Q001
C040
Q013
R048
JL013
C037
R019
C011
R046
Q012
JL012
Q011
R029
C014
R001
C004
Q006
R042
R044
C038
R022
R020
R026
C039
C041
R017
C045
R047
R043
C048
C047
C034
R027
C033
R050
R035
IC001
JL001
C042
JL003
R036
R018
C001
JL004
C046
C021
JL005
JL006
C015
R038
JL014
JL007
IC003
R037
R011
JL008
R014
IC002
JL009
C031
R040
JL010
C030
R012
Q005
Q004
R039
R041
JL011
C023
C012
C029
C025
C026
R045
C027
R023
R015
R004
JL002
1-669-555-
11

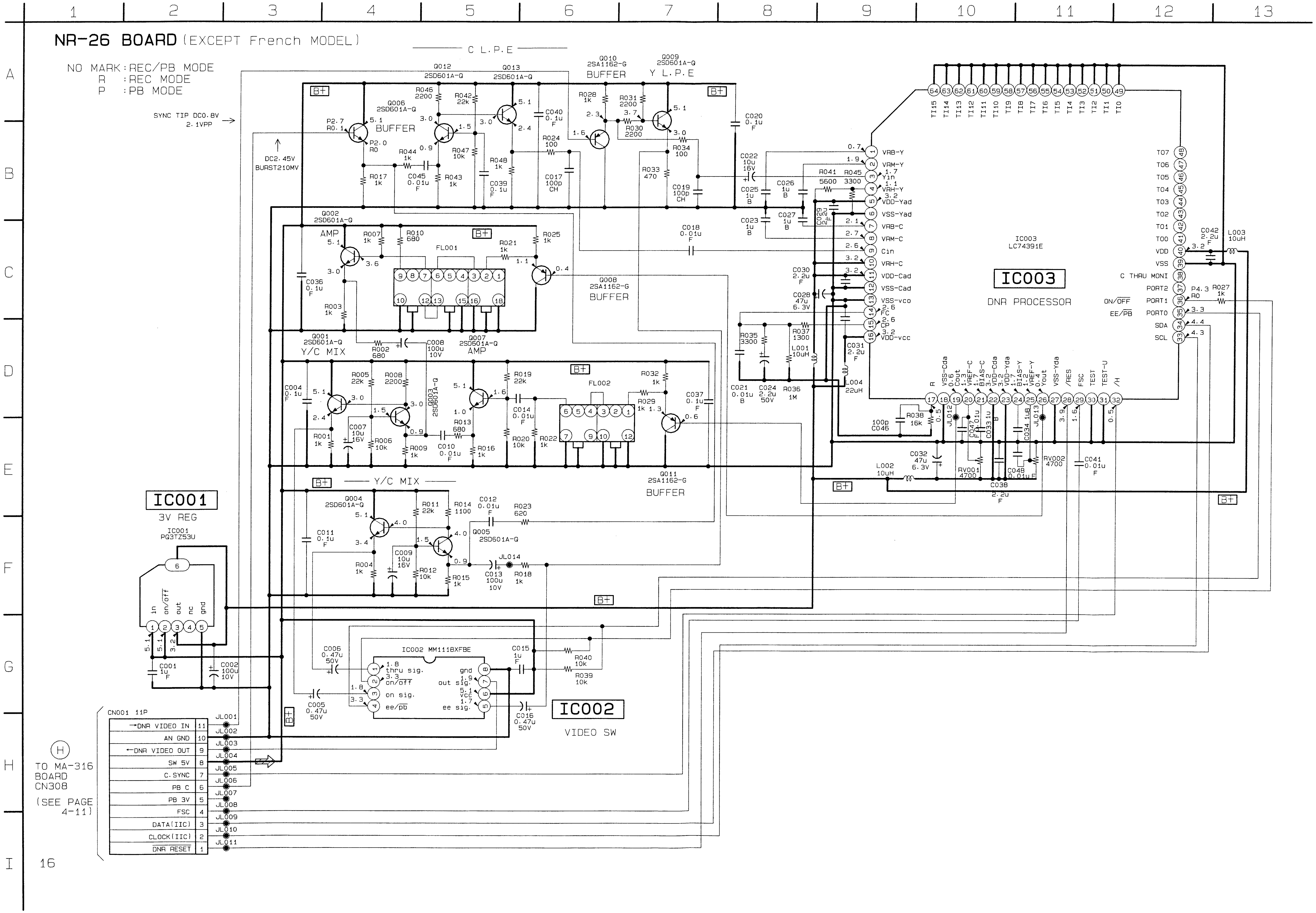
NR-26 BOARD

IC001	B-7	Q006	B-7
IC002	C-7	Q007	B-6
IC003	C-5	Q008	A-5
		Q009	A-7
Q001	B-6	Q010	A-7
Q002	A-6	Q011	B-5
Q003	A-6	Q012	B-7
Q004	C-6	Q013	B-7
Q005	C-6		


ML-15
<F900/F990 MODEL>
(SERIAL TRANSFER)
RP-231
(REC/PB AMP)
SE-69 <French MODEL>
NR-26
<EXCEPT French MODEL>
(PROCESSOR)
MA-316
VIDEO, AUDIO,
SERVO/SYSTEM CONTROL,
TUNER
AT-24
<F900/F990 MODEL>
(LARGE ANTENNA)
SW-300
<F900/F990 MODEL>
(REMOTE CONTROL RECEIVER)
POWER BLOCK
AT-23
<F900/F990 MODEL>
(SMALL ANTENNA)
FR-128
(MODE CONTROL)
DM-73
(OPERATION SWITCHES)

NR-26 (DNR PROCESSOR) SCHEMATIC DIAGRAM

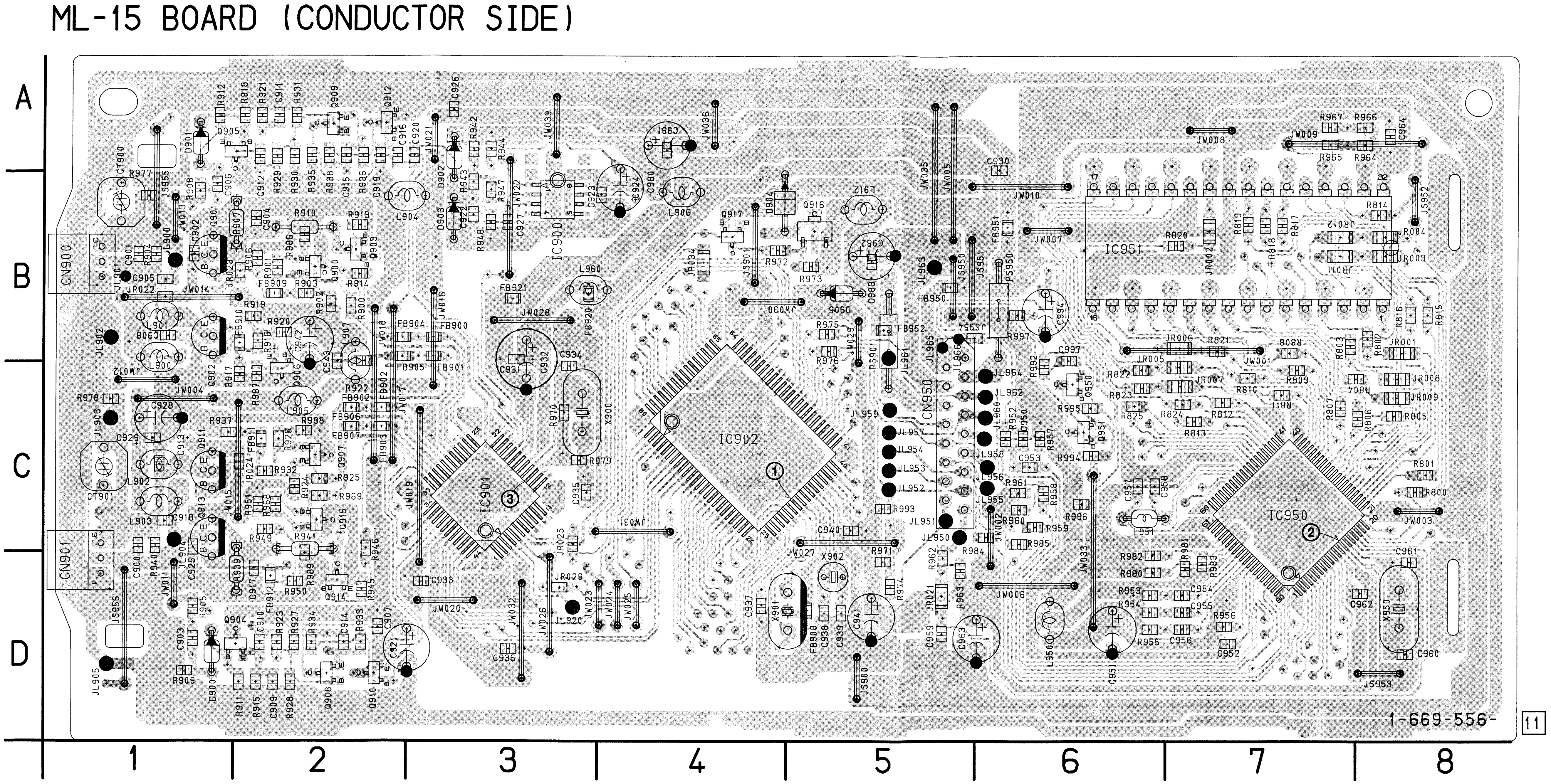
— Ref. No.: NR-26 Board; 6,000 Series —

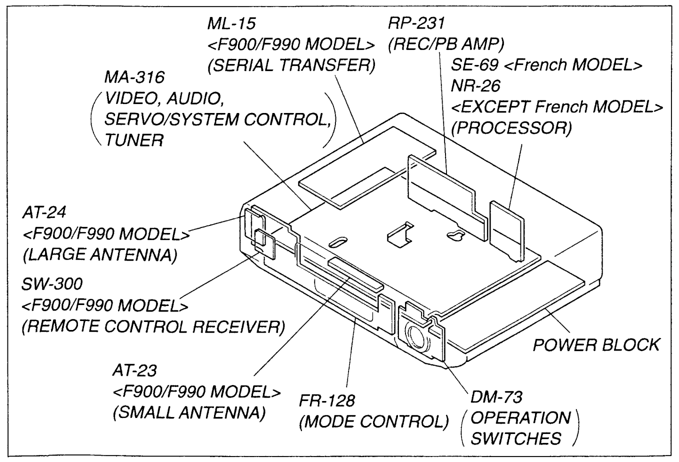

1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
NR-26 BOARD (EXCEPT French MODEL)
NO MARK : REC/PB MODE
R : REC MODE
P : PB MODE
SYNC TIP DC0.8V 2.1VPP
DC2.45V BURST210MV
C L.P.E
Y L.P.E
Q012 2SD601A-Q
Q013 2SD601A-Q
Q010 2SA1162-G BUFFER
Q009 2SD601A-Q
Q006 2SD601A-Q BUFFER
Q002 2SD601A-Q AMP
FL001
FL002
Q008 2SA1162-G BUFFER
Q001 2SD601A-Q Y/C MIX
Q007 2SD601A-Q AMP
Q003 2SD601A-Q
Q011 2SA1162-G BUFFER
Y/C MIX
Q004 2SD601A-Q
Q005 2SD601A-Q
B+
IC001
3V REG
IC001 PQ3TZ53U
in
on/off
out
nc
gnd
IC002 MM1118XFBE
thru sig.
on/off
on sig.
ee/pb
gnd
out sig.
vcc
ee sig.
IC002
VIDEO SW
IC003
LC74391E
DNR PROCESSOR
VRB-Y
VRM-Y
Yin
VRH-Y
VDD-Yad
VSS-Yad
VRB-C
VRM-C
Cin
VRH-C
VDD-Cad
VSS-Cad
VSS-vco
FC
CP
VDD-vcc
TO7
TO6
TO5
TO4
TO3
TO2
TO1
TO0
VDD
VSS
C THRU MONI
PORT2
PORT1
PORT0
SDA
SCL
ON/OFF
EE/PB
TI15
TI14
TI13
TI12
TI11
TI10
TI9
TI8
TI7
TI6
TI5
TI4
TI3
TI2
TI1
TI0
R
VSS-Cda
Cout
VREF-C
BIAS-C
VDD-Cda
VDD-Yda
BIAS-Y
VREF-Y
Yout
VSS-Yda
/RES
FSC
TEST
TEST-U
/H
L001 10uH
L002 10uH
L003 10uH
L004 22uH
RV001 4700
RV002 4700
CN001 11P
DNR VIDEO IN
AN GND
DNR VIDEO OUT
SW 5V
C.SYNC
PB C
PB 3V
FSC
DATA(IIC)
CLOCK(IIC)
DNR RESET
JL001
JL002
JL003
JL004
JL005
JL006
JL007
JL008
JL009
JL010
JL011
H
TO MA-316 BOARD CN308
(SEE PAGE 4-11)
16

ML-15 (SERIAL TRANSFER) PRINTED WIRING BOARD

— Ref. No.: ML-15 Board; 6,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.


ML-15 BOARD (CONDUCTOR SIDE)
A
B
C
D
1
2
3
4
5
6
7
8
CN900
CN901
CN950
IC900
IC901 ③
IC902 ①
IC950 ②
IC951
X900
X901
X902
X950
CT900
CT901
L900
L901
L902
L903
L904
L905
L906
L912
L950
L951
L960
1-669-556-
11

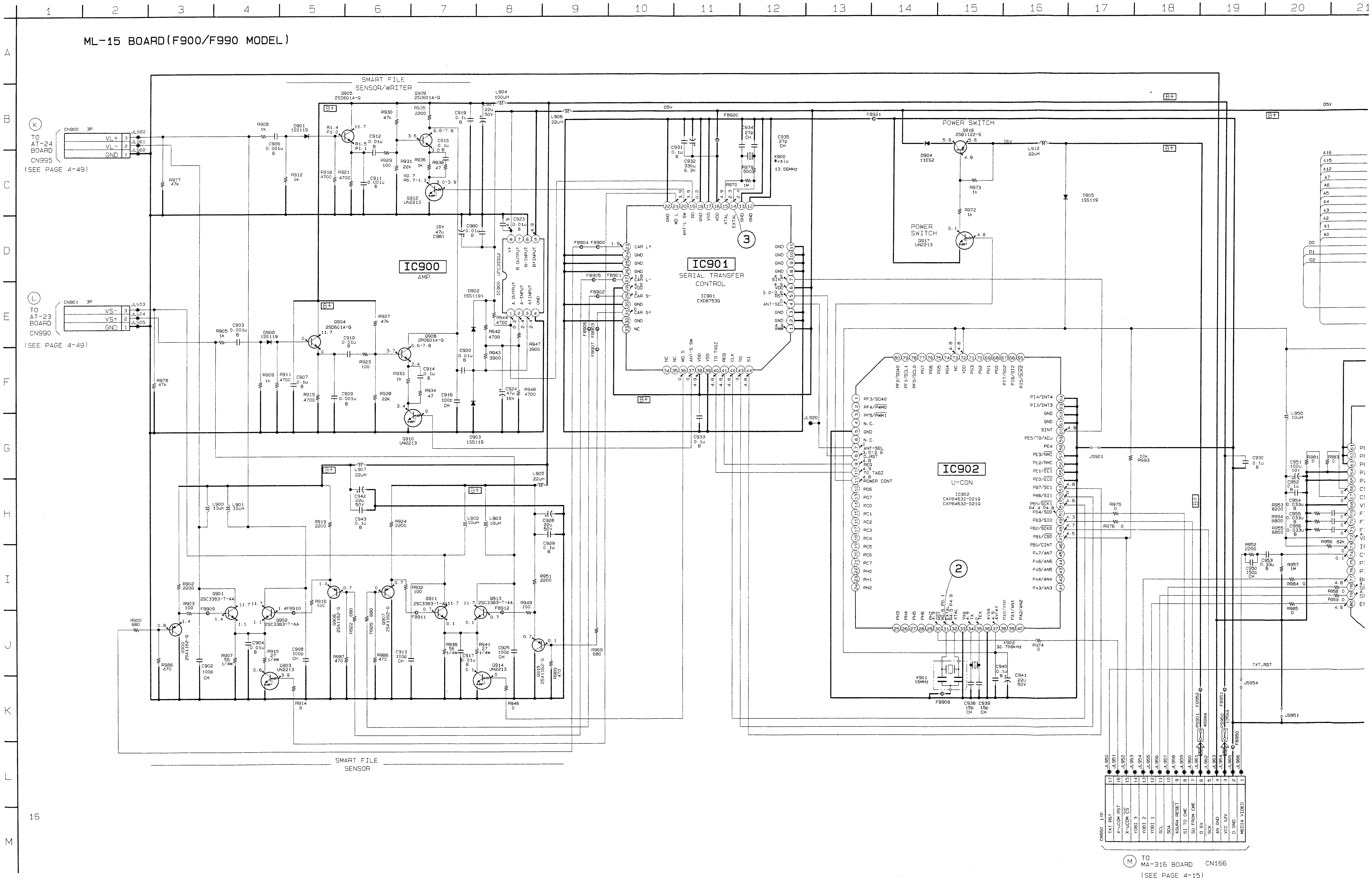

ML-15
<F900/F990 MODEL>
(SERIAL TRANSFER)
RP-231
(REC/PB AMP)
SE-69 <French MODEL>
NR-26
<EXCEPT French MODEL>
(PROCESSOR)
MA-316
(VIDEO, AUDIO,
SERVO/SYSTEM CONTROL,
TUNER
AT-24
<F900/F990 MODEL>
(LARGE ANTENNA)
SW-300
<F900/F990 MODEL>
(REMOTE CONTROL RECEIVER)
POWER BLOCK
AT-23
<F900/F990 MODEL>
(SMALL ANTENNA)
FR-128
(MODE CONTROL)
DM-73
(OPERATION
SWITCHES)

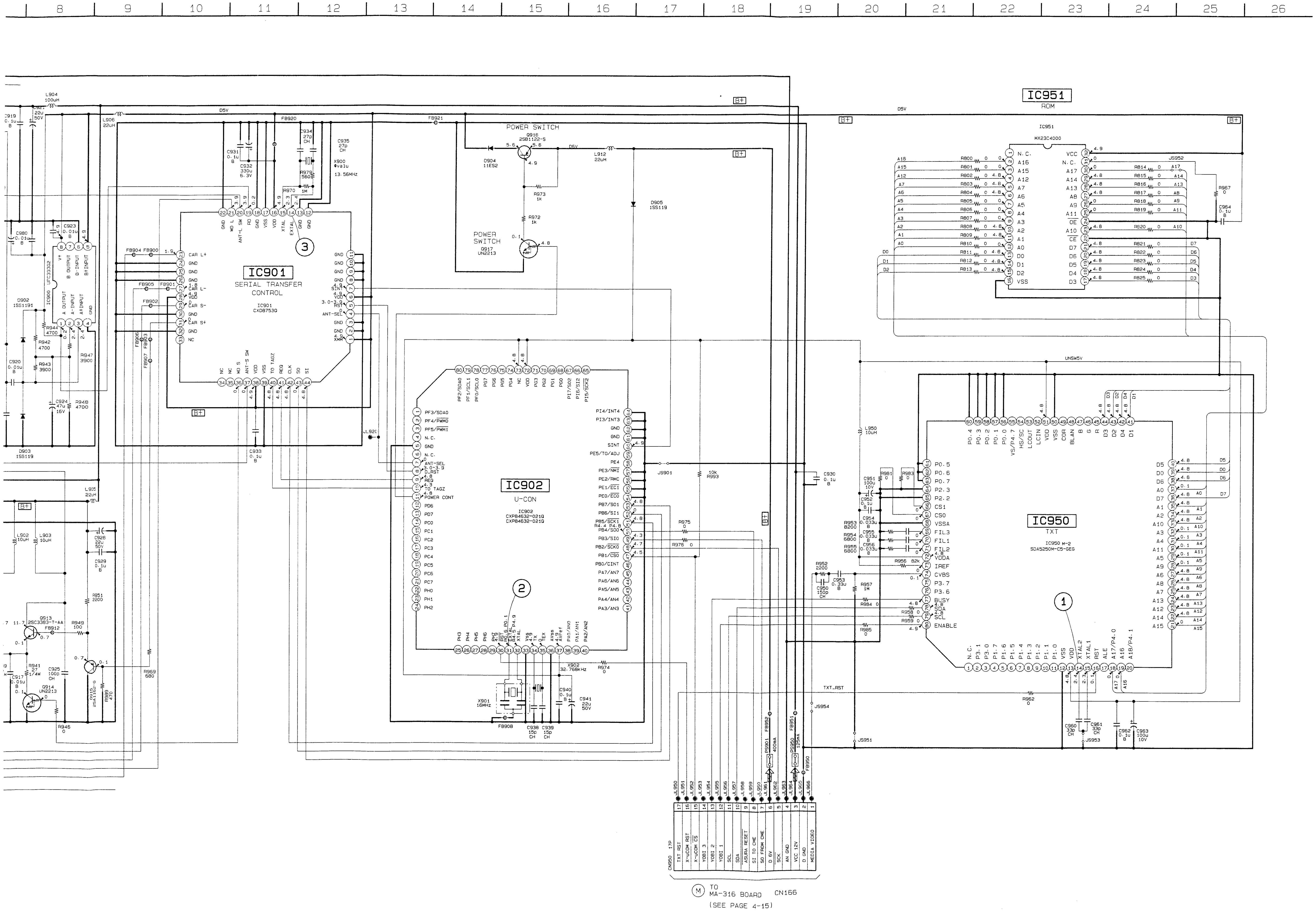
ML-15 BOARD

D900	D-1	Q904	D-2
D901	A-1	Q905	A-2
D902	A-3	Q906	C-2
D903	B-3	Q907	C-2
D904	B-5	Q908	D-2
D905	B-5	Q909	B-2
		Q910	D-2
IC900	B-3	Q911	C-1
IC901	C-3	Q912	A-2
IC902	C-4	Q913	C-1
IC950	D-7	Q914	D-2
		Q915	C-2
Q900	B-2	Q916	B-5
Q901	B-1	Q917	B-4
Q902	B-1		
Q903	B-2		

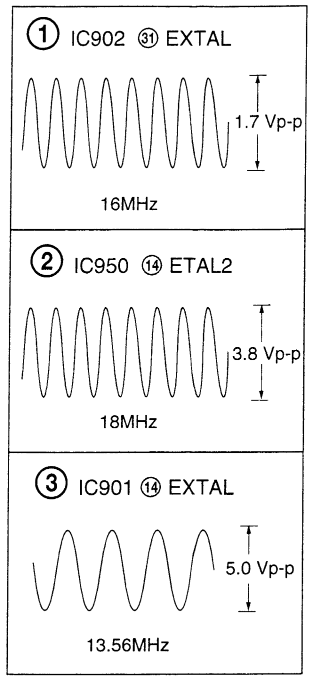
ML-15 (SERIAL TRANSFER) SCHEMATIC DIAGRAM

— Ref. No.: ML-15 Board; 6,000 Series —


ML-15 BOARD(F900/F990 MODEL)
SMART FILE SENSOR/WRITER
TO AT-24 BOARD CN995 (SEE PAGE 4-49)
CN900 3P
VL+
VL-
GND
TO AT-23 BOARD CN990 (SEE PAGE 4-49)
CN901 3P
VS-
VS+
GND
IC900 AMP
IC901 SERIAL TRANSFER CONTROL
IC901 CXD8753Q
IC902 U-CON
IC902 CXP84632-021Q CXP84532-021Q
POWER SWITCH
Q916 2SB1122-S
Q917 UN2213
X900 13.56MHz
X901 16MHz
X902 32.768kHz
SMART FILE SENSOR
TO MA-316 BOARD CN166 (SEE PAGE 4-15)
CN950 17P
TXT RST
X-uCOM RST
X-uCOM CS
YOBI 3
YOBI 2
YOBI 1
SCL
SDA
ASUKA RESET
SI TO CHE
SO FROM CHE
D 6V
SCK
AN GND
VCC 12V
D GND
MEDIA VIDEO
D5V
B+
15


8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
IC901
SERIAL TRANSFER CONTROL
IC901 CXD8753Q
IC902
U-CON
IC902 CXP84632-021Q
IC950
TXT
IC950 M-2 SDA5250M-C5-GEG
IC951
ROM
IC951 MX23C4000
POWER SWITCH
Q916 2SB1122-S
POWER SWITCH
Q917 UN2213
IC900 UPC3303Q2
X900 13.56MHz
X901 16MHz
X902 32.768kHz
D5V
B+
CN950 17P
TXT RST
X-uCOM RST
X-uCOM CS
YOBI 3
YOBI 2
YOBI 1
SCL
SDA
ASURA RESET
SI TO CME
SO FROM CME
D 6V
SCK
AN GND
VCC 12V
D GND
MEDIA VIDEO
Ⓜ TO MA-316 BOARD CN166
(SEE PAGE 4-15)
①
②
③

ML-15 BOARD



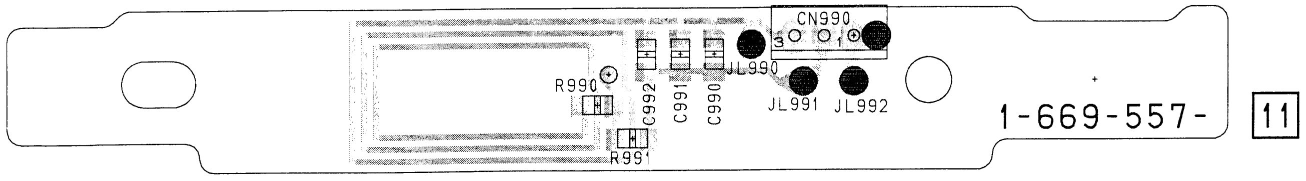
SERIAL TRANSFER
ML-15

AT-23/24 (ANTENNA) PRINTED WIRING BOARD

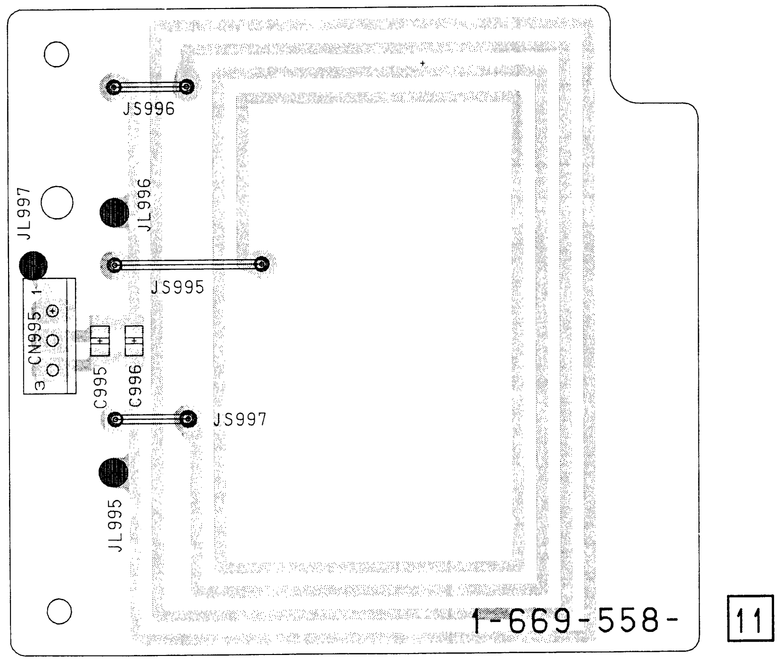
— Ref. No.: AT-23/24 Board; 4,000 Series —

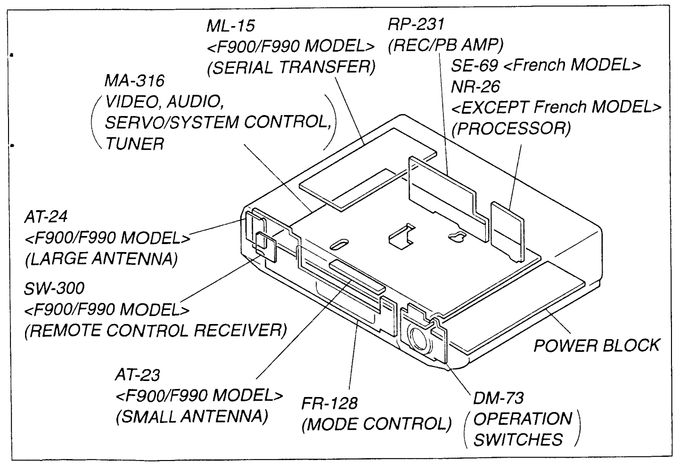
There are few cases that the part printed on this diagram isn't mounted in this model.

AT-23 BOARD (CONDUCTOR SIDE)


CN990
3
1
JL990
R990
C992
C991
C990
JL991
JL992
R991
1-669-557-
11

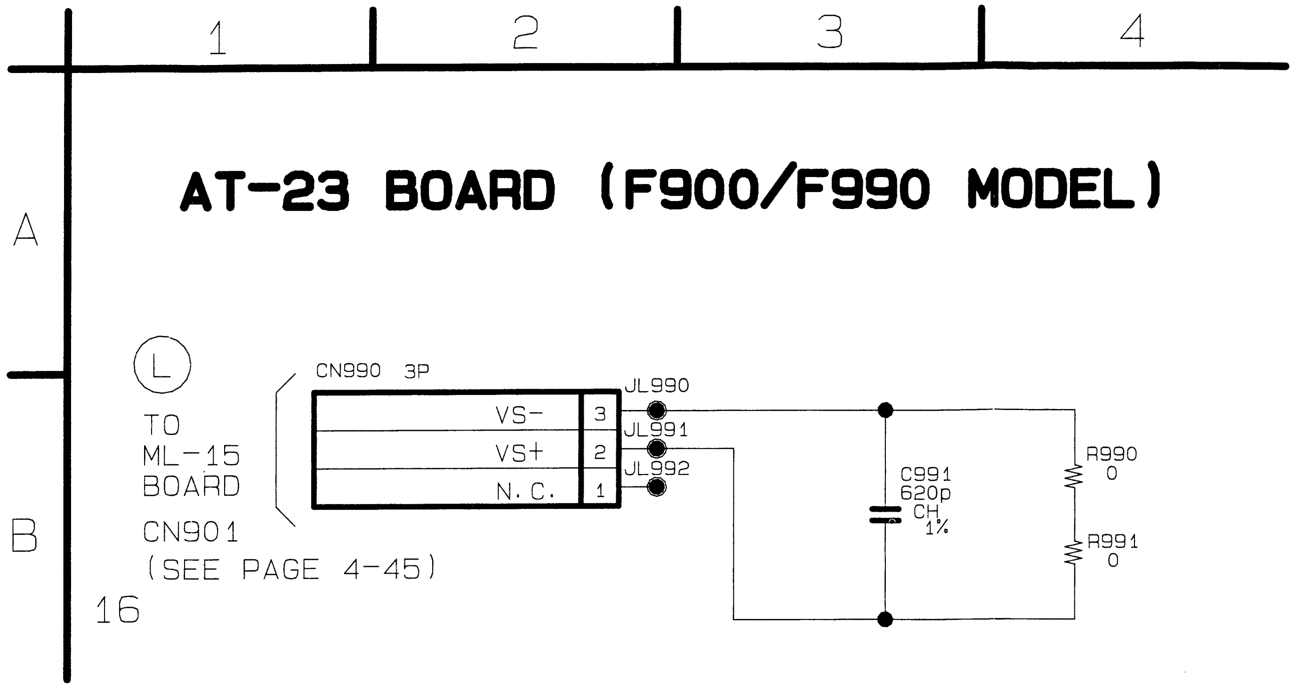
AT-24 BOARD (CONDUCTOR SIDE)

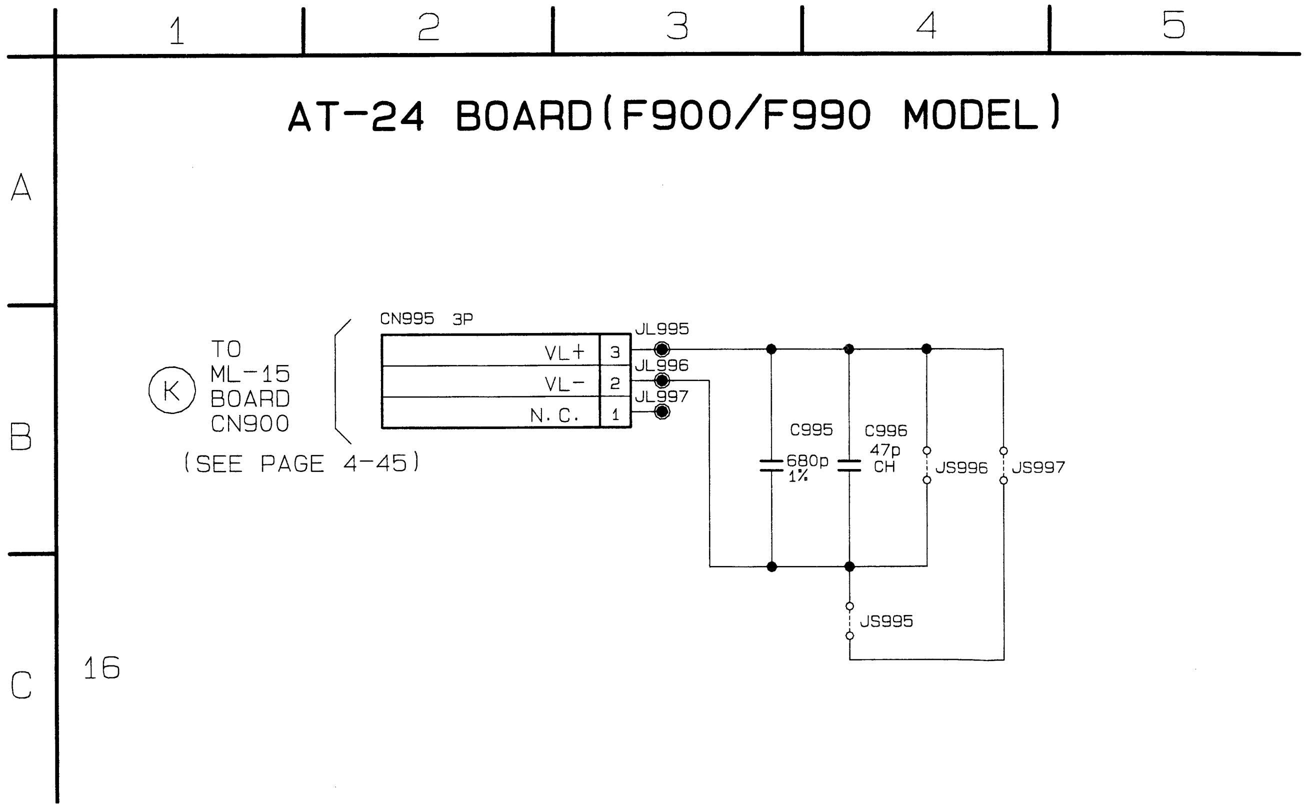

JS996
JL997
JL996
JS995
CN995
1
3
C995
C996
JS997
JL995
1-669-558-
11


ML-15
<F900/F990 MODEL>
(SERIAL TRANSFER)
RP-231
(REC/PB AMP)
MA-316
VIDEO, AUDIO,
SERVO/SYSTEM CONTROL,
TUNER
SE-69 <French MODEL>
NR-26
<EXCEPT French MODEL>
(PROCESSOR)
AT-24
<F900/F990 MODEL>
(LARGE ANTENNA)
SW-300
<F900/F990 MODEL>
(REMOTE CONTROL RECEIVER)
POWER BLOCK
AT-23
<F900/F990 MODEL>
(SMALL ANTENNA)
FR-128
(MODE CONTROL)
DM-73
(OPERATION SWITCHES)

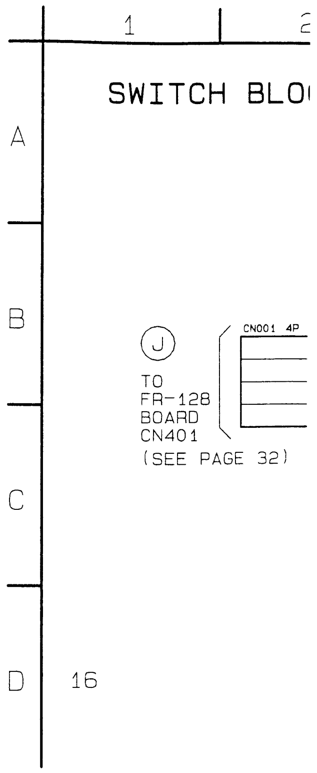
AT-23/24 (ANTENNA) SCHEMATIC DIAGRAM

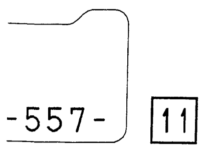
— Ref. No.: AT-23/24 Board; 4,000 Series —


1
2
3
4
A
B
AT-23 BOARD (F900/F990 MODEL)
L
TO
ML-15
BOARD
CN901
(SEE PAGE 4-45)
CN990 3P
VS-
VS+
N. C.
3
2
1
JL990
JL991
JL992
C991
620p
CH
1%
R990
0
R991
0
16


1
2
3
4
5
A
B
C
AT-24 BOARD(F900/F990 MODEL)
K
TO
ML-15
BOARD
CN900
(SEE PAGE 4-45)
CN995 3P
VL+
VL-
N. C.
3
2
1
JL995
JL996
JL997
C995
680p
1%
C996
47p
CH
JS996
JS997
JS995
16

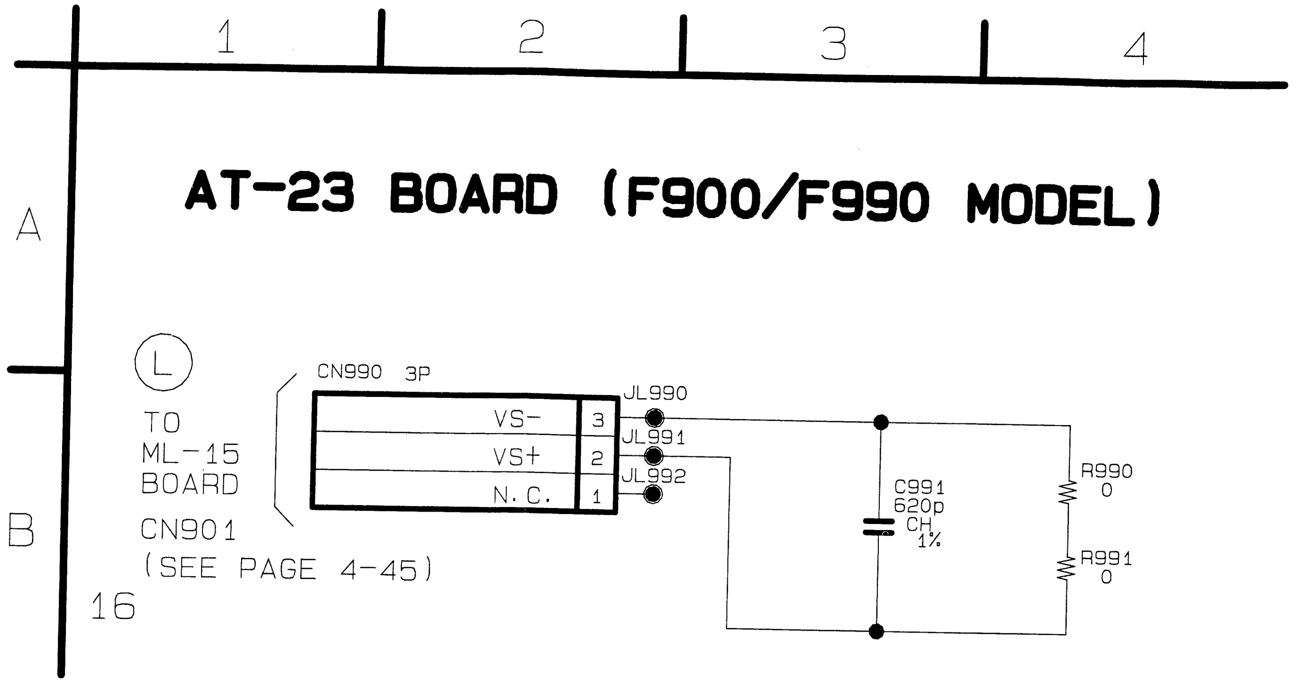
SWITCH BLOCK SCHEMAT

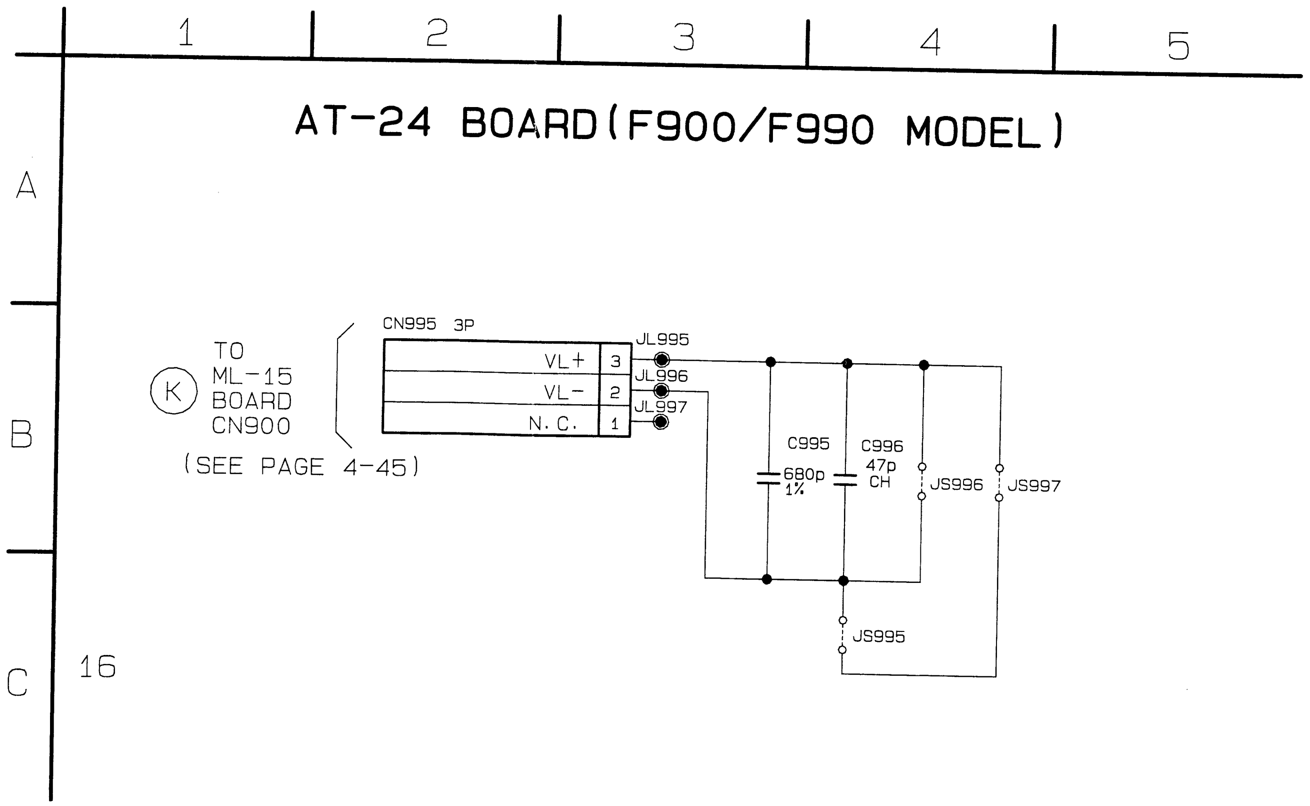

1
A
B
C
D
SWITCH BLO
J
CN001 4P
TO
FR-128
BOARD
CN401
(SEE PAGE 32)
16



AT-23/24 (ANTENNA) SCHEMATIC DIAGRAM

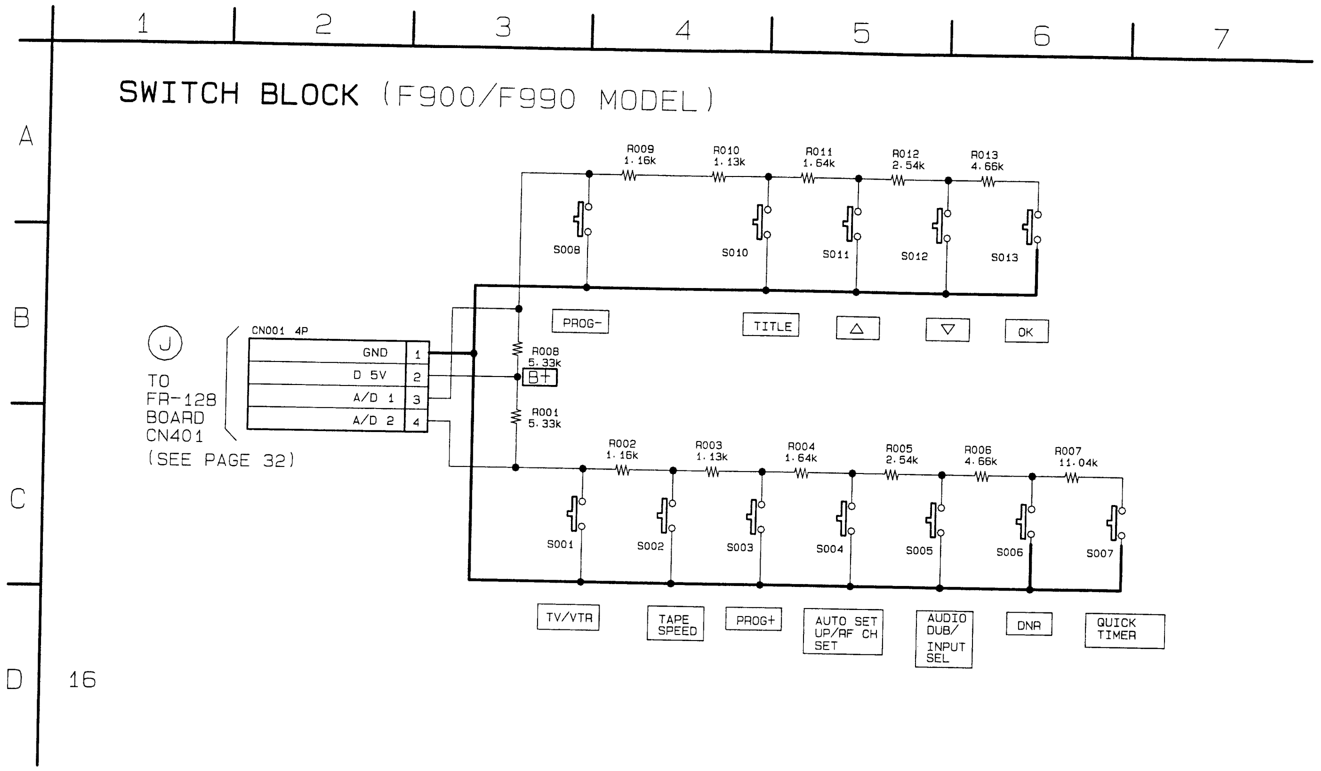
— Ref. No.: AT-23/24 Board; 4,000 Series —


1
2
3
4
A
B
AT-23 BOARD (F900/F990 MODEL)
L
TO
ML-15
BOARD
CN901
(SEE PAGE 4-45)
CN990 3P
VS-
VS+
N.C.
3
2
1
JL990
JL991
JL992
C991
620p
CH
1%
R990
0
R991
0
16


1
2
3
4
5
A
B
C
AT-24 BOARD(F900/F990 MODEL)
TO
K
ML-15
BOARD
CN900
(SEE PAGE 4-45)
CN995 3P
VL+
VL-
N.C.
3
2
1
JL995
JL996
JL997
C995
680p
1%
C996
47p
CH
JS996
JS997
JS995
16

SWITCH BLOCK SCHEMATIC DIAGRAM

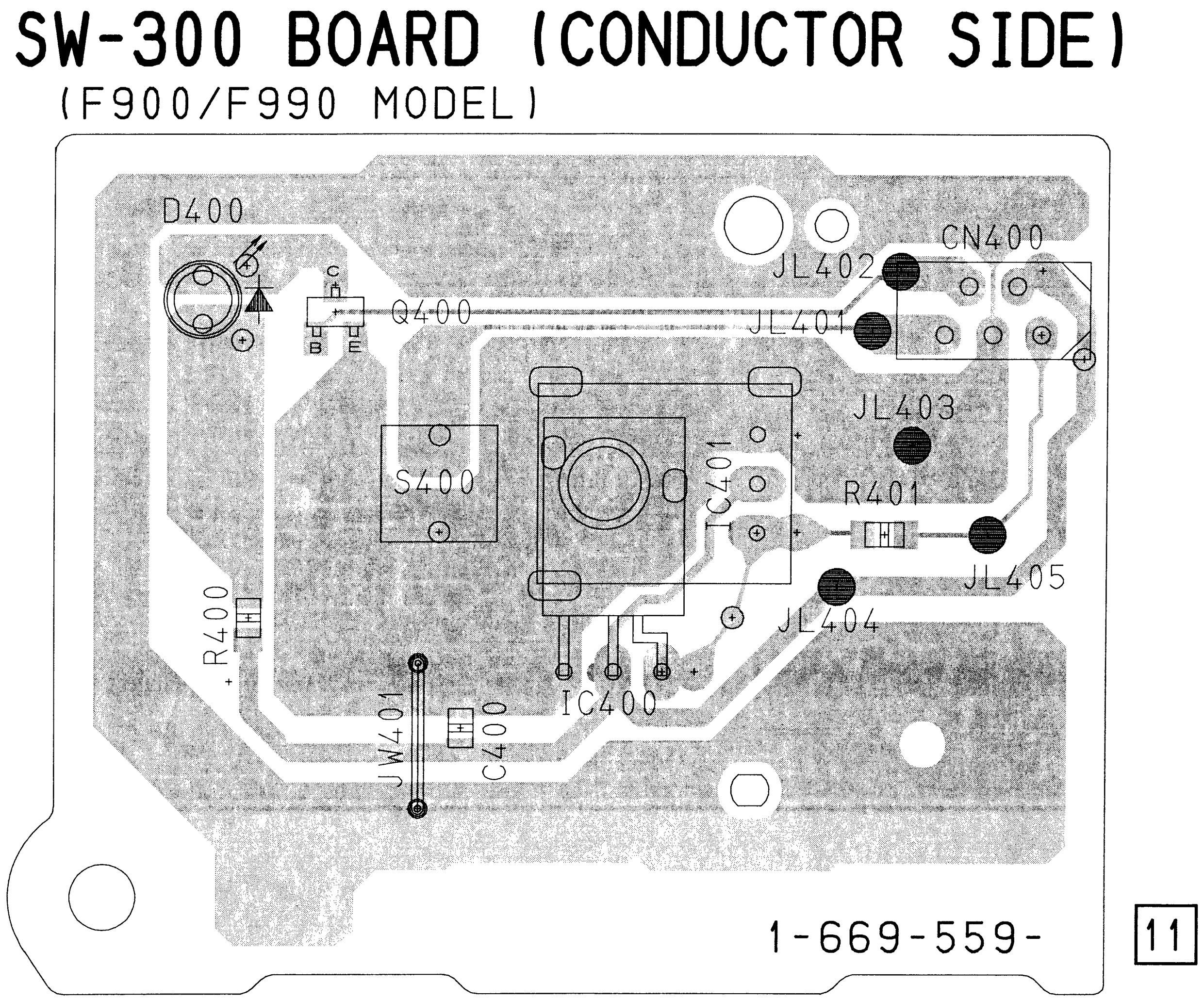
• The printed wiring board is not shown.


1
2
3
4
5
6
7
A
B
C
D
SWITCH BLOCK (F900/F990 MODEL)
R009
1.16k
R010
1.13k
R011
1.64k
R012
2.54k
R013
4.66k
S008
S010
S011
S012
S013
PROG-
TITLE
△
▽
OK
J
TO
FR-128
BOARD
CN401
(SEE PAGE 32)
CN001 4P
GND
D 5V
A/D 1
A/D 2
1
2
3
4
R008
5.33k
B+
R001
5.33k
R002
1.16k
R003
1.13k
R004
1.64k
R005
2.54k
R006
4.66k
R007
11.04k
S001
S002
S003
S004
S005
S006
S007
TV/VTR
TAPE SPEED
PROG+
AUTO SET UP/RF CH SET
AUDIO DUB/ INPUT SEL
DNR
QUICK TIMER
16

SW-300 (REMOTE CONTROL RECEIVER) PRINTED WIRING BOARD

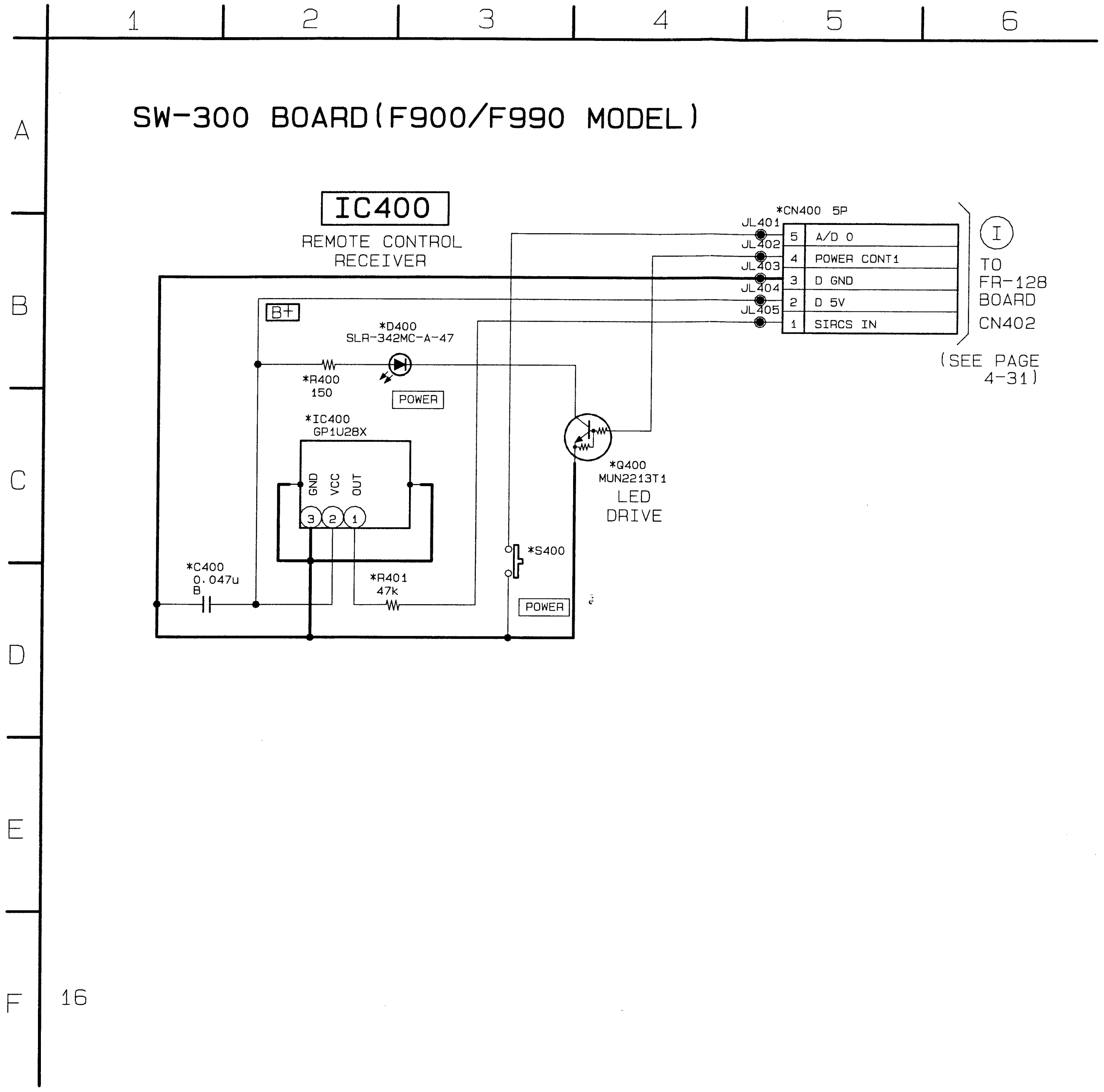
— Ref. No.: SW-300 Board; 7,000 Series —

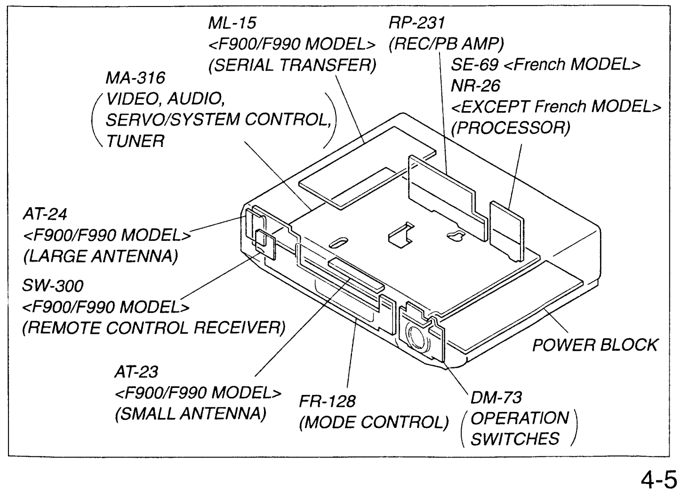
There are few cases that the part printed on this diagram isn't mounted in this model.


SW-300 BOARD (CONDUCTOR SIDE)
(F900/F990 MODEL)
D400
C
B E
Q400
JL402
JL401
CN400
JL403
S400
IC401
R401
JL405
JL404
R400
JW401
C400
IC400
1-669-559-
11

SW-300 (REMOTE CONTROL RECEIVER) SCHEMATIC DIAGRAM

— Ref. No.: SW-300 Board; 7,000 Series —

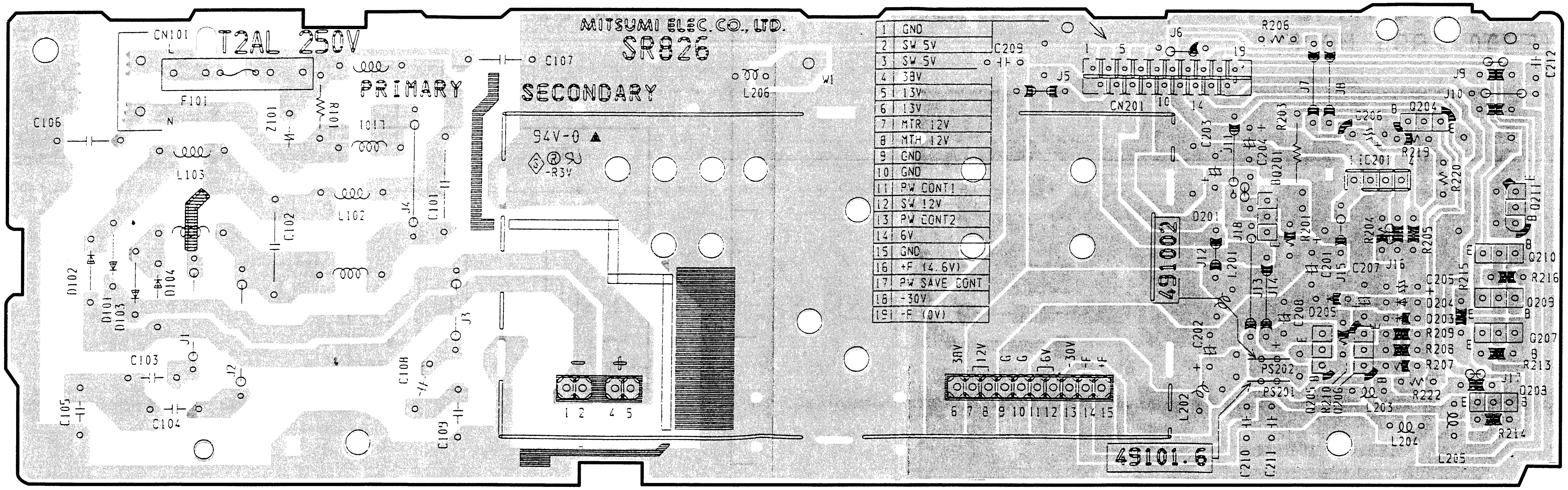

1
2
3
4
5
6
A
B
C
D
E
F
SW-300 BOARD(F900/F990 MODEL)
IC400
REMOTE CONTROL RECEIVER
B+
*D400
SLR-342MC-A-47
*R400
150
POWER
*IC400
GP1U28X
GND
VCC
OUT
3
2
1
*C400
0.047u
B
*R401
47k
*S400
POWER
*Q400
MUN2213T1
LED DRIVE
*CN400 5P
JL401
JL402
JL403
JL404
JL405
5 A/D 0
4 POWER CONT1
3 D GND
2 D 5V
1 SIRCS IN
I
TO FR-128 BOARD CN402
(SEE PAGE 4-31)
16


ML-15
<F900/F990 MODEL>
(SERIAL TRANSFER)
RP-231
(REC/PB AMP)
SE-69 <French MODEL>
NR-26
<EXCEPT French MODEL>
(PROCESSOR)
MA-316
(VIDEO, AUDIO, SERVO/SYSTEM CONTROL, TUNER)
AT-24
<F900/F990 MODEL>
(LARGE ANTENNA)
SW-300
<F900/F990 MODEL>
(REMOTE CONTROL RECEIVER)
POWER BLOCK
AT-23
<F900/F990 MODEL>
(SMALL ANTENNA)
FR-128
(MODE CONTROL)
DM-73
(OPERATION SWITCHES)

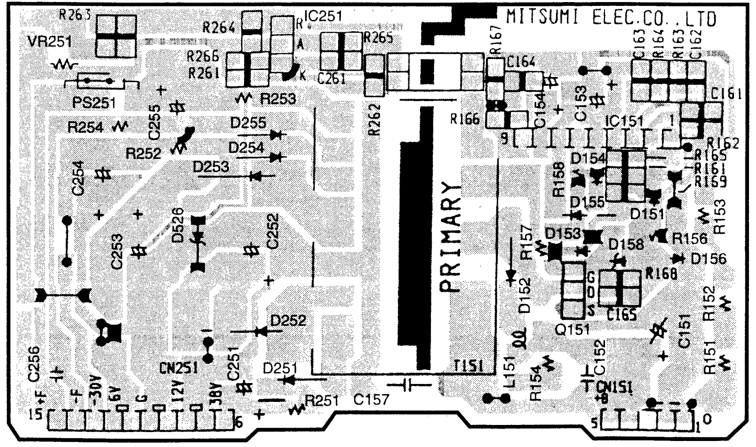
POWER BLOCK SR826 (SWITCHING REGULATOR) PRINTED WIRING BOARD
— Ref. No. SR826 Board; 9,000 Series —

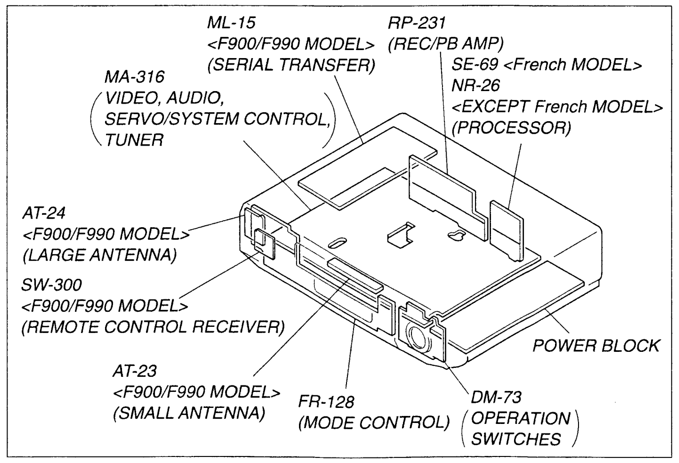
POWER BLOCK SR826

MAIN BOARD (CONDUCTOR SIDE)


MITSUMI ELEC.CO., LTD.
SR826
T2AL 250V
PRIMARY
SECONDARY
94V-0
1 GND
2 SW 5V
3 SW 5V
4 38V
5 13V
6 13V
7 MTR 12V
8 MTR 12V
9 GND
10 GND
11 PW CONT1
12 SW 12V
13 PW CONT2
14 6V
15 GND
16 +F (4.6V)
17 PW SAVE CONT
18 -30V
19 -F (0V)
CN101
F101
CN201
IC201
491002
49101.6

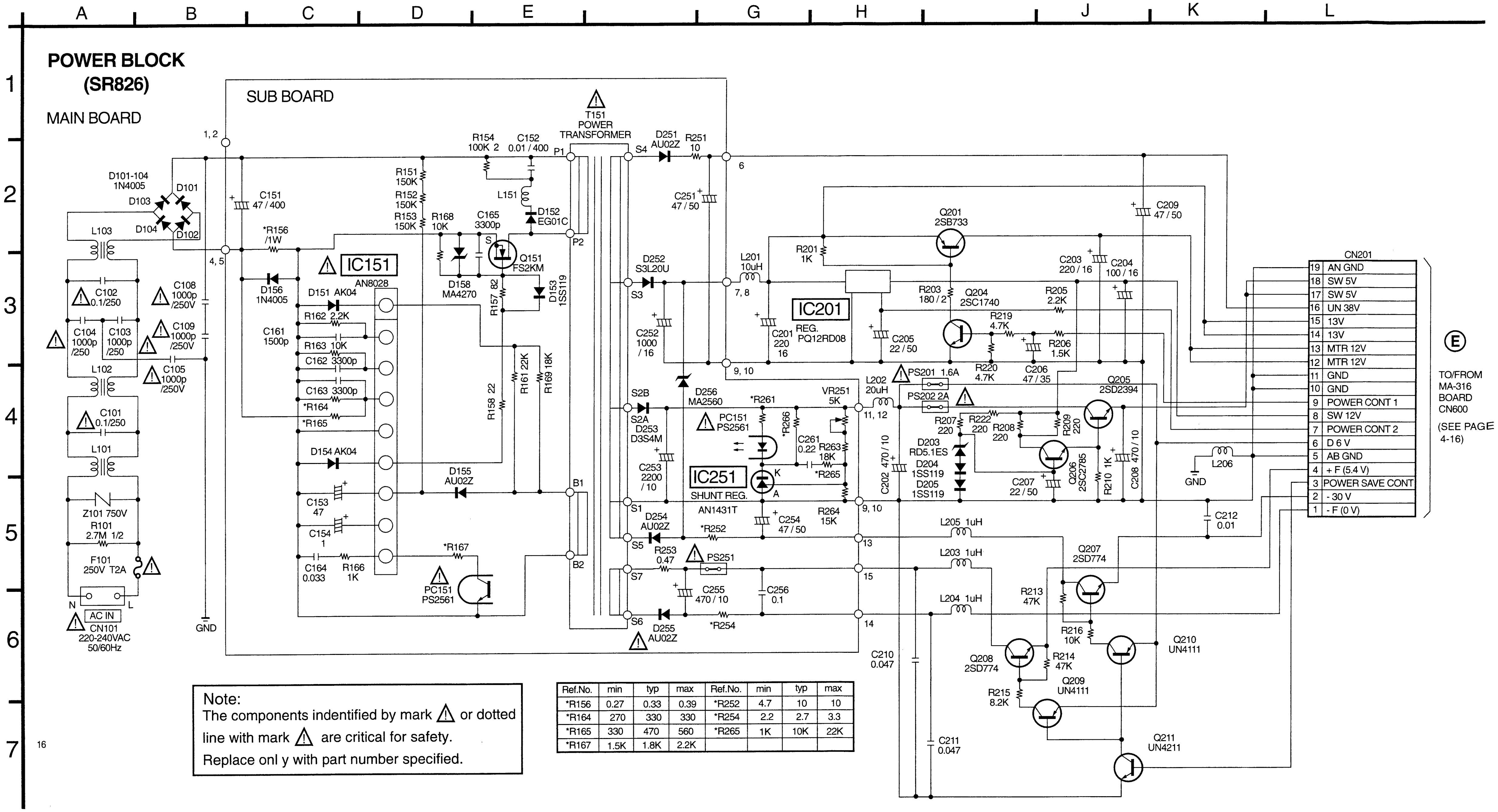
SUB BOARD (CONDUCTOR SIDE)


MITSUMI ELEC.CO.,LTD
PRIMARY
VR251
PS251
IC251
IC151
CN251
CN151
T151
Q151


ML-15
<F900/F990 MODEL>
(SERIAL TRANSFER)
RP-231
(REC/PB AMP)
SE-69 <French MODEL>
NR-26
<EXCEPT French MODEL>
(PROCESSOR)
MA-316
VIDEO, AUDIO,
SERVO/SYSTEM CONTROL,
TUNER
AT-24
<F900/F990 MODEL>
(LARGE ANTENNA)
SW-300
<F900/F990 MODEL>
(REMOTE CONTROL RECEIVER)
POWER BLOCK
AT-23
<F900/F990 MODEL>
(SMALL ANTENNA)
FR-128
(MODE CONTROL)
DM-73
OPERATION
SWITCHES

POWER BLOCK SR826 (SWITCHING REGULATOR) SCHEMATIC DIAGRAM

— Ref. No. SR826 Board; 9,000 Series —


A
B
C
D
E
G
H
J
K
L
1
2
3
4
5
6
7
POWER BLOCK
(SR826)
MAIN BOARD
SUB BOARD
T151
POWER
TRANSFORMER
R154
100K 2
C152
0.01 / 400
P1
P2
D251
AU02Z
R251
10
S4
6
D101-104
1N4005
D101
D102
D103
D104
L103
C151
47 / 400
*R156
/1W
R151
150K
R152
150K
R153
150K
R168
10K
C165
3300p
L151
D152
EG01C
Q151
FS2KM
IC151
AN8028
D156
1N4005
D151 AK04
D158
MA4270
R157 82
D153
1SS119
R162 2.2K
R163 10K
C162 3300p
C163 3300p
*R164
*R165
C161
1500p
R158 22
R161 22K
R169 18K
D154 AK04
C153
47
C154
1
C164
0.033
R166
1K
D155
AU02Z
*R167
PC151
PS2561
B1
B2
C102
0.1/250
C108
1000p
/250V
C109
1000p
/250V
C104
1000p
/250
C103
1000p
/250
C105
1000p
/250V
L102
C101
0.1/250
L101
Z101 750V
R101
2.7M 1/2
F101
250V T2A
N
L
AC IN
CN101
220-240VAC
50/60Hz
GND
1, 2
4, 5
C251
47 / 50
D252
S3L20U
S3
L201
10uH
7, 8
C252
1000
/ 16
9, 10
C201
220
16
IC201
REG.
PQ12RD08
R201
1K
Q201
2SB733
R203
180 / 2
Q204
2SC1740
C205
22 / 50
R219
4.7K
R205
2.2K
R206
1.5K
C203
220 / 16
C204
100 / 16
C209
47 / 50
S2B
S2A
D253
D3S4M
D256
MA2560
*R261
VR251
5K
PC151
PS2561
*R266
C261
0.22
R263
18K
*R265
C253
2200
/ 10
IC251
SHUNT REG.
AN1431T
K
A
C254
47 / 50
R264
15K
L202
20uH
11, 12
PS201 1.6A
PS202 2A
R220
4.7K
C206
47 / 35
Q205
2SD2394
R207
220
R222
220
R208
220
R209
220
D203
RD5.1ES
D204
1SS119
D205
1SS119
C202 470 / 10
C207
22 / 50
Q206
2SC2785
R210 1K
C208 470 / 10
L206
GND
S1
D254
AU02Z
*R252
9, 10
13
S5
R253
0.47
PS251
S7
C255
470 / 10
C256
0.1
15
S6
D255
AU02Z
*R254
14
L205 1uH
L203 1uH
L204 1uH
C212
0.01
Q207
2SD774
R213
47K
R216
10K
Q210
UN4111
Q208
2SD774
R214
47K
Q209
UN4111
R215
8.2K
C210
0.047
C211
0.047
Q211
UN4211
CN201
19 AN GND
18 SW 5V
17 SW 5V
16 UN 38V
15 13V
14 13V
13 MTR 12V
12 MTR 12V
11 GND
10 GND
9 POWER CONT 1
8 SW 12V
7 POWER CONT 2
6 D 6V
5 AB GND
4 + F (5.4 V)
3 POWER SAVE CONT
2 - 30 V
1 - F (0 V)
E
TO/FROM
MA-316
BOARD
CN600
(SEE PAGE
4-16)
16

Note:
The components indentified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace onl y with part number specified.

Ref.No.	min	typ	max	Ref.No.	min	typ	max
*R156	0.27	0.33	0.39	*R252	4.7	10	10
*R164	270	330	330	*R254	2.2	2.7	3.3
*R165	330	470	560	*R265	1K	10K	22K
*R167	1.5K	1.8K	2.2K				

SECTION 5
INTERFACE, IC PIN FUNCTION DESCRIPTION

5-1. SYSTEM CONTROL — VIDEO BLOCK INTERFACE (MA-316 BOARD IC160)

Signal	Pin No.	I/O	STOP FF/REW	TAPE THREADING	TAPE UNTHREADING	PB	PB PAUSE	SLOW	x 2	CUE	REVIEW	REC	REC PAUSE
RF SWP	①	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
QVD	④	O	L	L	L	*2	*3	*3	*2	*3	*3	L	L
V SYNC	(66)	I	*4	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
NT JUDGE	⑬	O	L	L	L	L	L	L	L	L	L	L	L

*1 Synchronized with drum rotation. 25Hz 50% duty cycle.
*2 Normally "L". "H" when CTL signal is not generated.
*3 V period "H" pulse.
*4 Selected by REC mode. "H" in LP mode."
*5 Composite sync signal (positive).

5-2. SYSTEM CONTROL — SERVO PERIPHERAL CIRCUIT INTERFACE (MA-316 BOARD IC160)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREADING	TAPE UNTHREADING	PB	PB PAUSE	SLOW	CUE	x 2	REVIEW	REC	REC PAUSE
REC CTL	⑦	O	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	*1	Hi-Z
CAP STOP	㉟	O (O.D)	L	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)	L	*3	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)
STEP PLS	(99)	O	L	L	L	L	L	L	L	*2	L	L	L	L	L
PB CTL	(67)	I	H	*6	*6			*1	H/L	*2	*6	*6	*6	*1	H
DRM PG	(68)	I	*4	*1	*1	*5	*5	*1	*1	*1	*1	*1	*1	*1	*1
DRM FG	(69)	I	*4	*7	*7	*5	*5	*7	*7	*7	*7	*7	*7	*7	*7
CAP FG	(70)	I	H/L	*6	*6	*5	*5	*6	H/L	*2	*6	*6	*6	*6	H/L
CAP DA	(73)	O	*8	*8	*8	*8	*8	*9	*8	*8	*9	*8	*9	*9	*8
DRM DA	(74)	O	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10
CTL RESET	⑧	I/O	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	*11	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z

*1. 25Hz pulse.
*2. Pulse at tape running.
*3. Reverse logic pulse of STEP PLS.
*4. "L" when drum rotation stops.
*5. Unstable period pulse.
*6. Pulse in period in proportional to tape speed.
*7. 300Hz pulse.
*8. Pulse at tape running.
*9. Approx. 2 msec period "H" or "L" pulse.
*10. Approx. 1.5 msec period "H" or "L" pulse.
*11. "L" when FWD SLOW, "H" when RVS SLOW.

5-3. SYSTEM CONTROL — MECHANISM INTERFACE (MA-316 BOARD IC160)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TAPE THREADING	TAPE UNTHREADING	STOP	FF	REW	PB	PB PAUSE	SLOW	x 2	CUE	REVIEW	REC	REC PAUSE
CAM2	⑨	HI-Z	L	H	L	H	L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
MODE 1 (*8)	㉒	I	H	L	L	*1	*1	H	H	H	H	H	H	H	H	L	H	H
MODE 2 (*8)	㉑	I	H	L	L	*1	*1	H	H	H	L	L	L	L	L	L	L	L
MODE 3 (*8)	⑳	I	L	L	L	*1	*1	H	L	L	L	L	L	L	L	H	L	L
MODE 4 (*8)	⑲	I	L	H	H	*1	*1	L	H	H	H	L	L	L	L	L	L	L
(IN REC PRF)	⑮	I	H	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
T REEL FG	(64)	I	H/L	H/L	H/L	H/L	H/L	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
S REEL FG	(63)	I	H/L	H/L	H/L	*3	*3	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
T/E LED	㉜	O (O.D)	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
$\overline{\text{CAP STOP}}$	㉟	O (O.D)	L	L	L	H	H	L	H	H	H	L	*5	H	H	H	H	L
CAP RVS	(72)	O	H			L	H	H/L	L	H	L	L	L/*5	L	L	H	L	L
T SENS	(61)	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
S SENS	(62)	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6

*1. Uncertainly.
*2. "L" when erasing protection tab is bent. "H" when not bent.
*3. Pause of period in proportion to reel rotating speed.
*4. Approx. 2 msec period "H" pulse.
*5. Pulse at tape running.
*6. Normally "L". 2 msec period "H" pulse when tape top or tape end is detected.
*7. When transition to UNLOADING direction : "L".
When transition to LOADING direction : "H".
When CAM MOTOR is stopped : Hi-Z.
*8. When RVS slow : Mode 1="L"
When RVS slow : Mode 2="L"
When RVS slow : Mode 3="H"
When RVS slow : Mode 4="L"

5-4. SYSTEM CONTROL — SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-316 BOARD IC160)

Signal	Pin No.	I/O	I/O Level
$\overline{\text{ASURA RESET}}$	㊵	I	Normally "H". "L" when service interruption is detected or restored.
$\overline{\text{ASURA CS}}$	㊹	I	Chip select signal from timer microprocessor. V period "L" pulse.
S IN 0	㊺	I	Serial communication data from timer microprocessor. V period " L" pulse.
S OUT 0	㊻	O	Serial communication data to timer microprocessor. V period "L" pulse.
S CLK	㊼	I	Serial communication clock from timer microprocessor. V period "L" pulse.

5-5. SYSTEM CONTROL — AUDIO BLOCK INTERFACE (MA-316 BOARD IC160)

Signal	Pin No.	I/O	STOP/FF/ REW	TAPE LOADING	TAPE UNLOADING	PB	PB PAUSE	SLOW	x 2	CUE	REVIEW	REC	REC PAUSE
AF ENV	(59)	I	AF RF envelope signal input terminal for automatic tracking.										
A MUTEN	㉛	O (O.D)	L	L	L	*1	H	H	H	H	H	L	L
AF REC $\overline{\text{P}}$	②	O	L	L	L	L	L	L	L	L	L	H	L
AF SWP	(100)	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
FULL ERS	㊱	O (O.D)	H	H	H	H	H	H	H	H	H	L	H

*1. 25 Hz 50 % duty pulse approx. 5 msec delayed from RF SW P.

5-6. SERVO/SYSTEM CONTROL MICROPROCESSOR PIN FUNCTIONS (MA-316 BOARD IC160)

Pin No.	Pin Name	I/O	Function
1	RF SWP	O	RF switching pulse output.
2	AF REC $\overline{\text{P}}$	O	“H” when HiFi audio REC.
3	N.C.	—	Not used.
4	QVD	O	Quasi VD pulse output.
5	AUTO PRESET	O	“H” during auto preset.
6	FE ON	O	Flying erase ON/OFF
7	REC CTL	O	REC CTL signal output.
8	CTL RESET	O	Capstan current control. “H” during slow mode.
9	CAM 2	I	Cam motor control.
10	N.C.	—	Not used.
11	TA MUTE	O	Tuner audio mute. H: Mute
12	SECAM DET	I	“H” when the SECAM signal is detected.
13	NT JUDGE	I	4.43/3.58 judge input.
14	MESECAM DET	I	“H” when the MESECAM signal is detected.
15	CIN (REC PRE)	I	Erasing protection tab, cassette in detection signal input.
16	AV CONT	O	TV/VTR.
17	C+ DET	I	CANAL + detection.
18	SW1	O	BG/L control signal.
19	MODE 4	I	Cam encoder signal input.
20	MODE 3	I	Cam encoder signal input.
21	MODE 2	I	Cam encoder signal input.
22	MODE 1	I	Cam encoder signal input.
23	POWER SAVE CONT 1	O	-30V Power supply control.
24	POWER SAVE C+	O	C+ IC Power supply control.
25	MOD CONT	O	Tuner modulation output control signal.
26	SECAM ON	O	SECAM control signal output.
27	N.C.	—	Not used.
28	SDA 0	I/O	I^{2}C data.
29	N.C.	—	Not used.
30	SCL 0	I/O	I^{2}C clock.
31	A MUTE	O	“H” when audio mute.
32	T/E LED	O	Tape top/end sensors driver.
33	N.C.	—	Not used.
34	N.C.	—	Not used.
35	$\overline{\text{CAP STOP}}$	O	Capstan stop signal output.
36	FULL ERS	O	Full erase control.
37	N.C.	—	Not used.
38	N.C.	—	Not used.
39	MP	I	Fixed to “L”.
40	$\overline{\text{ASURA RESET}}$	I	System reset signal.
41	VSS	—	Ground.
42	XTAL	O	System clock 16MHz.
43	EXTAL	I	System clock 16MHz.
44	$\overline{\text{ASURA CS}}$	I	Servo/system control microcomputer chip select signal.
45	S IN 0	I	Serial communication signal.
46	S OUT 0	O	Serial communication signal.
47	SCLK	I	Serial communication signal.
48	N.C.	—	Not used.
49	N.C.	—	Not used.
50	N.C.	—	Not used.
51	SW2	O	BG/L’ control signal.
52	AVSS	—	Unswitched ground.
53	AVREF	—	AD port reference input UNSW 5V.
54	AVDD	—	UNSW 5V.
55	NTPB SW	I	NTSC playback switch.
56	AV ADJ	I	Adjustment mode.
57	FOLLOW TV	I	Synchro-TP detection signal.
58	GND	—	Ground.
59	AF ENV	I	HiFi audio playback signal envelope.
60	RF ENV	I	Video playback signal envelope.
61	T SENS	I	Take-up end sensor.
62	S SENS	I	Supply end sensor.
63	S REEL FG	I	Supply reel FG input.
64	T REEL FG	I	Take-up reel FG input.
65	N.C.	—	Not used.
66	CSYNC	I	Composite sync. signal input.
67	$\overline{\text{PB CTL}}$	I	Playback CTL input.
68	DRM PG	I	Drum PG input.
69	DRM FG	I	Drum FG input.
70	CAP FG	I	Capstan FG input.
71	SECAM MIX	O	SECAM MIX control.
72	CAP RVS	O	Capstan reverse control “H” when reverse.
73	CAP DA	O	Capstan error D/A output.
74	DRM DA	O	Drum PG output.
75	CTL REC	—	Not used.
76	CTL STEP	—	Not used.
77	REC COUNT	I	Counter signal input when recording.
78	GND	—	Ground.
79	DNR RESET	O	DNR reset signal.
80	DATA (SSB)	O	Serial communication data.
81	CLOCK (SSB)	O	Serial communication clock.
82	N.C.	—	Not used.
83	N.C.	—	Not used.
84	CAP TRQ PWM	O	PWM output for capstan torque control.
85	N.C.	—	Not used.
86	N.C.	—	Not used.
87	N.C.	—	Not used.
88	VSS	—	Ground.
89	VDD	—	5V.
90	5V	—	5V.
91	N.C.	—	Not used.
92	CTL HYS HIGH	O	CTL amp gain control.
93	N.C.	—	Not used.
94	N.C.	—	Not used.
95	N.C.	—	Not used.
96	REC	O	“H” output when hifi audio recording.
97	N.C.	—	Not used.
98	N.C.	—	Not used.
99	STEP PLS	O	Step pulse “H” when capstan step driving.
100	AF SWP	O	AF switching pulse output.

5-7. TUNER/TIMER MODE CONTROL PIN FUNCTIONS (FR-128 BOARD IC180)

Pin No.	Pin Name	I/O	Function
1	TXT RST	O	Teletext IC (ML Board IC950) reset signal
2	N.C.	—	
3	LANC IN (SENSOR)	I	Lanc input
4	LANC OUT (SENSOR)	O	Lanc output
5	N.C.	—	
6	SIRCS IN	I	Remote control input
7	EEP DATA	I/O	I^{2}C bus interface data input/output
8	EEP SCL	I/O	I^{2}C bus interface clock input/output
9	SDA	I/O	I^{2}C bus interface data input/output
10	SCL	I/O	I^{2}C bus interface clock input/output
11	FDP CS	O	FLD driver chip select
12	LED CS	O	LED driver chip select
13	X-UCOM CS	O	ML IC chip select(ML board IC902)
14	N.C.	—	
15	VSS	—	Ground
16	TU ENABLE	O	Tuner chip select
17	PLL CLK	O	Tuner PLL clock
18	PLL DATA	O	Tuner PLL data
19	OSD CS	O	OSD IC (MA-316 board IC660) chip select
20	N.C.	—	
21	ASURA RESET	O	S/S micon (MA-316 board IC160) reset signal
22	ASURA CS	O	S/S micon (MA-316 board IC160) chip select signal
23	POWER CONT	O	Main power supply control signal
24	POWER CONT	O	Secondary power supply control signal
25	N.C	—	
26	OPTION 1	O	ML board IC950 enable signal
27	OPTION 2	I	ML board IC950 busy signal
28	N.C.	—	
29	OPTION 3	—	ML
30	N.C.	—	
31	N.C.	—	
32	Not used	—	Positive supply voltage
33	Not used	—	Positive supply voltage
34	Not used	—	Positive supply voltage
35	SI (TO CME)	I	Serial data input
36	SO (FROM CME)	O	Serial data output
37	SCLK	I/O	SCLK
38	N.C.	—	
39	N.C.	—	
40	RST	I	System reset
41	VSS	—	Ground
42	XTAL	O	Internal oscillator output for 20MHz crystal
43	EXTAL	I	Internal oscillator 20MHz crystal input
44	VDD	—	Positive supply voltage
45	N.C.	—	
46	N.C.	—	
47	OSD SO (FROM CME)	O	Serial data output
48	OSD CLK	O	Serial clock input/output
49	N.C.	—	
50	N.C.	—	
51	N.C.	—	
52	N.C.	—	
53	VDD	—	Positive supply voltage
54	TEX	I	Internal oscillator 32kHz crystal input
55	TX	O	Internal oscillator output for 32kHz crystal
56	VSS	—	Ground
57	AV LINK OUT	O	AV LINK output
58	SIRCS OUT	O	Remote control output
59	N.C.	—	
60	N.C.	—	
61	N.C.	—	
62	BUZZER	O	Buzzer output/clock crystal frequency division output
63	POWER FAIL	I	Power voltage drop detection pin
64	Not used	—	Positive supply voltage
65	Not used	—	Positive supply voltage
66	CGV	I	Vertical synchro detection
67	PDC DAV	I	VPS/PDC acknowledge signal
68	Not used	—	Positive supply voltage
69	AV LINK IN	I	AV LINK input
70	Not used	—	Positive supply voltage
71	Not used	—	Positive supply voltage
72	A/D0	I	Key pad reading
73	A/D1	I	Key pad reading
74	A/D2	I	Key pad reading
75	A/D3	I	Key pad reading
76	A VSS	—	Ground
77	A VREF0	—	Positive supply voltage
78	A VREF1	—	Positive supply voltage
79	A VDD	—	Positive supply voltage
80	A/D4	I	Key pad reading
81	A/D5	I	Key pad reading
82	A/D6	—	
83	Not used	—	
84	DMS1	I	
85	DMS2	I	
86	AFT	I	Ground wave tuner AFT detection
87	HDET	I	HDET signal input
88	VDD	—	Positive supply voltage
89	VDD	—	Positive supply voltage
90	VSS	—	Ground
91	N.C.	—	
92	N.C.	—	
93	N.C.	—	
94	N.C.	—	
95	N.C.	—	
96	N.C.	—	
97	N.C.	—	
98	N.C.	—	
99	EEP MODE	O	EEP mode control
100	0X-UCOM RST	O	X-UCOM reset signal (IC902 ML board)

SECTION 6
ADJUSTMENTS

6-1. MECHANICAL ADJUSTMENTS

For the mechanical adjustments, please refer to the "VHS MECHANICAL ADJUSTMENT MANUAL Ⅵ (S MECHANISM)" (9-921-647-11).

6-2. ELECTRICAL ADJUSTMENTS

See the adjustment parts location diagram on page 6-6 for the adjustment.

2-1. PREPARATION BEFORE ADJUSTMENT

2-1-1. Equipment Required

The measuring instruments used for this alignment include:

1) Monitor TV
2) Oscilloscope, dual-trace, bandwidth of 30MHz or more, with delay mode (A probe 10:1 should be used unless otherwise specified.)
3) Frequency counter
4) Pattern generator
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Alignment tapes
    KRV-51P   Part No. : 8-192-605-36

2-1-2. Equipment Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown in the following diagram.

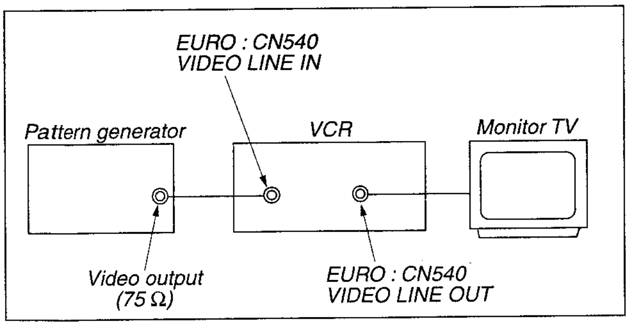


Fig. 6-2-1

2-1-3. Input Signal Check

Video signal produced by a pattern generator is used as an adjustment signal to perform electrical alignment for this unit. This video signal must satisfy the specification.

Unless otherwise specified, place the switches and controls of this unit in the following positions:

- INPUT SELECT switch .... LINE 1

Connect an oscilloscope to the Video Input terminal. Check that the synchronizing signal of the Y signal has an amplitude of approximately 0.7V and that the burst signal has an amplitude of approximately 0.3V and its waveform is flat. And check that the level ratio of burst signal to "red" signal is 0.30 : 0.66. The video signal (color bar) used for electrical aligning this unit is shown in Fig. 6-2-2.

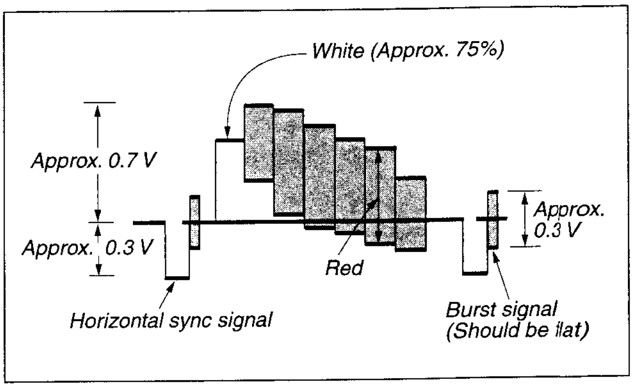


Fig. 6-2-2 Color Bar Signals of Pattern Generator

2-1-4. Alignment Tape

- Contents of KRV-51P

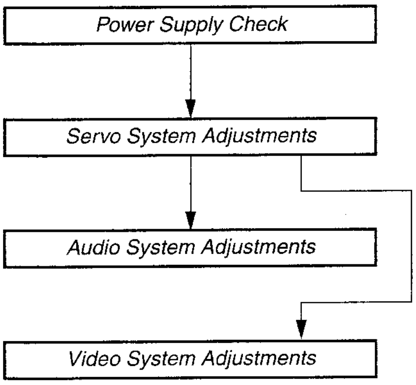
	Mode	Period	Video signal	Audio signal	
				Hi-Fi	Normal
1	SP	7 minutes	Color bar	400Hz (L/R)	400Hz
2		3 minutes	Monoscope		
3	LP	7 minutes	Color bar		
4		3 minutes	Monoscope		

2-1-5. Input/Output Levels and Impedance

Video input:	LINE IN EURO Input signal: 1Vp-p, 75ohms, unbalanced, sync negative
Video output:	LINE OUT EURO Output signal: 1Vp-p, 75ohms, unbalanced, sync negative
Audio input:	LINE IN EURO Input level: –7.5 dBs (0dBs= 0.775Vrms) Input impedance: more than 47 kilohms
Audio output:	LINE OUT EURO Standard level: –7.5dBs at load impedance 47 kilohms Output impedance: less than 10 kilohms

2-1-6. Adjustment Sequence

The adjustments should be performed in the following sequence.



2-2. POWER SUPPLY CHECK

2-2-1. Output Voltage Check (MA-316 Board)

Mode	E-E
Measuring Instrument	Digital voltmeter
TUNER 30V Check	
Measurement point	D702 Cathode
Specified value	33 ± 2V
VCC 12V Check	
Measurement point	IC530 Pin ②
Specified value	12.0 ± 0.3V
D 5V Check	
Measurement point	D160 Cathode
Specified value	5.2 ± 0.3V

[Check Method]

1) Each of these supply voltages must meet its specified value.

2-3. SERVO SYSTEM CHECK

Unless otherwise specified, set the switches to the following positions.

- INPUT SELECT switch .... LINE 1
- TAPE SPEED switch .... SP

2-3-1. RF Switching Position/ AF Switching Position Adjustments (MA-316, RP-231 Boards)

[Adjustment Purpose]

To adjust the link of the A-ch and B-ch of the tape playback outputs. To make the unit compatible with other tapes and units. If this specification is not satisfied, the link will appear on the screen and the screen will be disrupted, etc.

Mode	Playback
Signal	Alignment tape: SP color bar portion
Measurement point	CH1: Video LINE OUT (RF switching position) CN341 pin ① (HF ADJ) (AF switching position) (RP-231 board) CH2: CN261 pin ③ (RF SWP) (RP-231 board)
Measuring instrument	Oscilloscope
Specified value	6.5 ± 0.5H (416 ± 32 μsec)

[Adjustment Method]

1) Short-circuit between pin ⑤ (AV ADJ) and ③ (GND) of CN261 for about 1 second to activate the RF switching position adjustment mode.
2) Check that "AF" is indicated on FL display.
3) Using the program + and – buttons, adjust to 416 ± 32μsec (6.5 ± 0.5H).
4) Press the PAUSE button.
5) The set goes to the AF switching position adjustment mode.

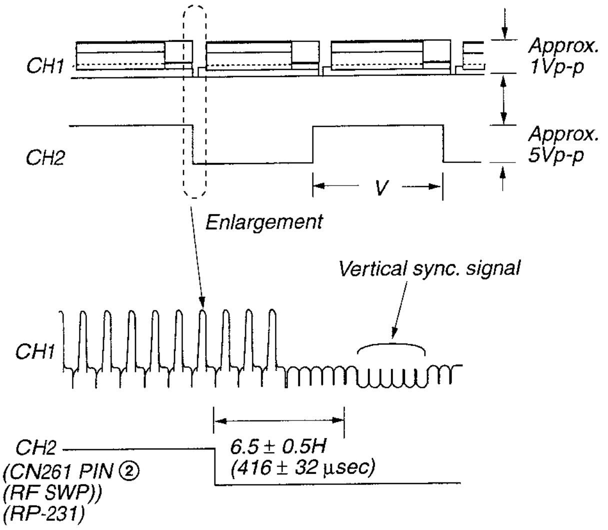

CH1
Approx.
1Vp-p
CH2
Approx.
5Vp-p
V
Enlargement
Vertical sync. signal
CH1
CH2
(CN261 PIN ②
(RF SWP))
(RP-231)
6.5 ± 0.5H
(416 ± 32 μsec)

Fig. 6-2-3

6) Check that "AH" is indicated on FL display.
7) Using the program + and – buttons, minimize a chipped portion. At this time, confirm that a noisy sound is not heard.
8) Press the PAUSE button.
9) Press the EJECT button.

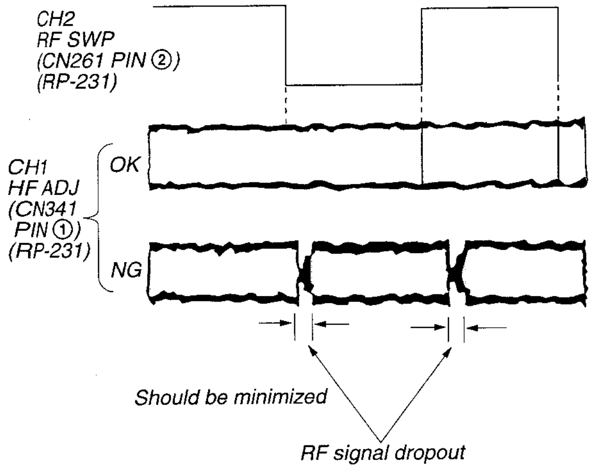

CH2
RF SWP
(CN261 PIN ②)
(RP-231)
CH1
HF ADJ
(CN341
PIN ①)
(RP-231)
OK
NG
Should be minimized
RF signal dropout

Fig. 6-2-4

2-4. VIDEO SYSTEM CHECKS

For the video system checks, follow the checking procedures given below as a rule. The color bar video signal supplied from the pattern generator is used as the video input signal for the video system adjustment of the recording mode. Check that the signal satisfies the specified value designated in the "Check of input signal" (Fig. 6-2-2)

Unless otherwise specified, set the switches to the following positions.

- INPUT SELECT switch .... LINE 1
- TAPE SPEED switch .... SP

[Checking Sequence]

1) X'tal OSC Check
2) SYNC AGC Check
3) White clip/Dark clip Check
4) Recording Y Level Check
5) Recording Chroma Level Check
6) Playback Level Check

2-4-1. X'tal OSC Check (MA-316 Board)

Mode	Playback
Signal	Alignment tape: SP Color bar portion
Measurement point	Q211 Emitter
Measuring instrument	Oscilloscope and Frequency counter
Specified value	4,433,619 ± 96Hz

Note: A frequency counter should be connected through a buffer amplifier (oscilloscope, etc.) having a high impedance and a low capacitance.

[Check Method]

1) Check that the oscillation frequency satisfies the specified value and that the oscillation voltage is 500 ± 200mVp-p.

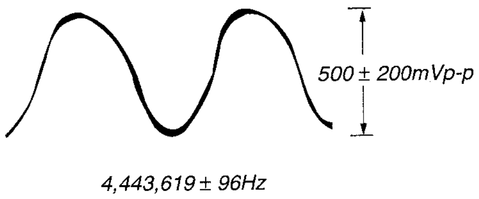

500 ± 200mVp-p
4,443,619 ± 96Hz

Fig. 6-2-5

2-4-2. SYNC AGC Check (MA-316 Board)

Mode	E-E
Signal	Color bar
Measurement point	IC201 pin ㊳
Measuring instrument	Oscilloscope
Specified value	A=2.1 ± 0.1Vp-p

[Check Method]

1) Check that the Video signal level (A) satisfies the specified value.

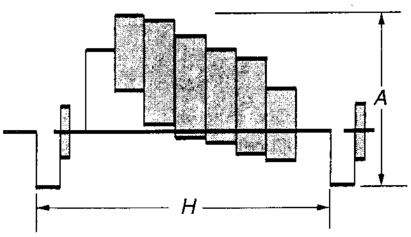


Fig. 6-2-6

2-4-3. White Clip/Dark Clip Check (MA-316 Board)

Mode	E-E
Signal	Color bar
Measurement point	IC201 pin ㊲
Measuring instrument	Oscilloscope
Specified value	White clip : 190 ± 15% Dark clip : 58.5 ± 5%

Connect a resistor of 3.3kΩ between IC201 pin ㊷ and GND.

[Check Method]

1) Check that the white clip level is 190 ± 15% to the white (100%) level.
2) Check that the dark chip level is 58.5 ± 5% to the white (100%) level.

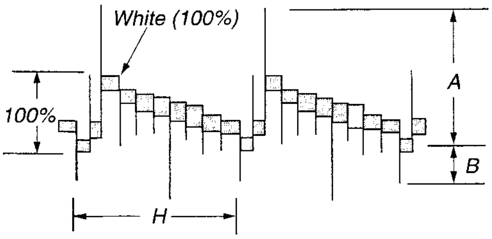


Fig. 6-2-7

2-4-4. Recording Y Level Check (MA-316 Board)

Mode	E-E
Signal	No-signal
Measurement point	IC201 pin ⑱
Measuring instrument	Oscilloscope
Specified value	A=307 ± 50mVp-p

[Check Method]

1) Check that the recording RF signal satisfies the specified value.

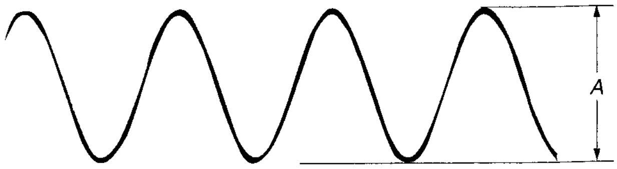


Fig. 6-2-8

2-4-5. Recording Chroma Level Check (MA-316 Board)

Mode	Recording
Signal	Color bar
Measurement point	IC201 pin ⑭
Measuring instrument	Oscilloscope
Specified value	A=350 ± 40mV

[Check Method]

1) Confirm the amplitude of recording chroma level becomes the specified value.

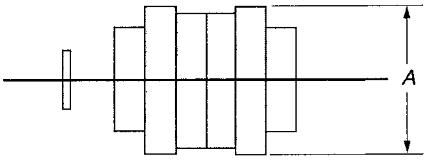


Fig. 6-2-9

2-4-6. Playback Level Check (MA-316 Board)

Mode	Playback
Signal Alignment	Alignment tape : SP mode color bar portion
Measurement point	Video LINE OUT terminal
Measuring instrument	Oscilloscope
Specified value	A=1.0 ± 0.1Vp-p (75Ω terminated)

[Check Method]

1) Check that the playback level satisfies the specified value.

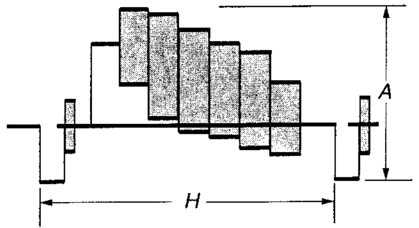


Fig. 6-2-10

2-5. AUDIO SYSTEM ADJUSTMENT

- For the adjustment of the audio system, perform in the SP mode if there is no special notes. Use the alignment tape.

[Connecting Instruments]

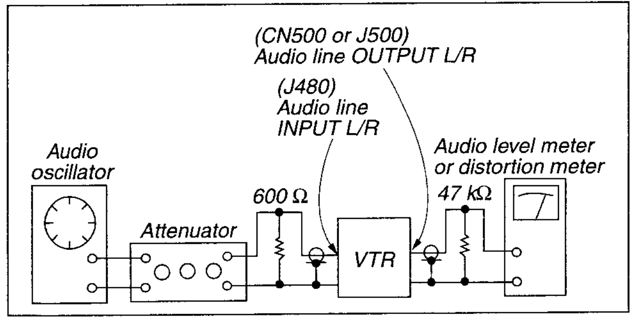

(CN500 or J500)
Audio line OUTPUT L/R
(J480)
Audio line
INPUT L/R
Audio oscillator
Audio level meter or distortion meter
600 Ω
47 kΩ
Attenuator
VTR

Fig. 6-2-11

- Adjust in the SP mode if there is no special indications.
- Perform the adjustment setting the switch on the following positions.
- INPUT SELECT switch .... LINE IN 2

[Adjustment Method]

1. ACE head adjustment.....Refer to the VHS mechanical adjustment manual Ⅵ.
2. E-E output level check
3. Overall Output level and distortion factor check
4. Overall noise level check.

2-5-1. ACE Head Adjustment

Refer to the "VHS mechanical adjustment manual Ⅵ " (9-921-647-11).

2-5-2. E-E Output Level Check

Mode	E-E
Signal	400Hz, –7.5dBs : J480 (LINE IN 2) on FR-128 board
Measurement point	J500 (AUDIO OUT), CN500 (LINE 1)
Measuring instrument	Audio level meter
Specified value	J500 : –7.5 ± 2.0dBs, CN500 : –6.3 ± 2.0dBs

[Check Method]

1) Input signal of 400Hz and –7.5dBs to J480 (LINE IN 2).
2) Check that the audio output level is the specified value.

2-5-3. Overall Output Level and Distortion Factor Check

Mode	Self-record playback
Signal	400Hz, –7.5dBs : J480 (LINE IN 2) on FR-128 board
Measurement point	CN500 (LINE 1) Pin ③ (L), Pin ① (R)
Measuring instrument	Audio level meter and Distortion meter
Specified value	Playback Level: –6.3 ± 3dBs Distortion: 4.0% or less

[Check Method]

1) Input signal of 400Hz and –7.5dBs to J480 (LINE IN 2).
2) Record signal.
3) Playback the recorded portion.
4) Check that the output level is –6.3 ± 3dBs.
5) Check that the distortion factor is 4.0% or less.

2-5-4. Overall Noise Level Check

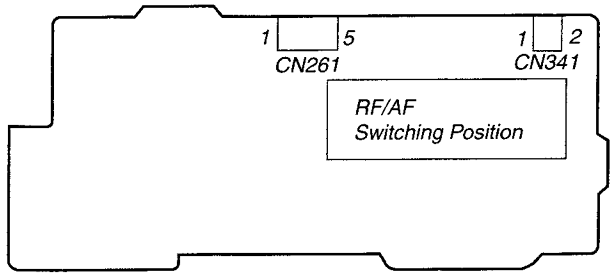
Mode	Self-record playback
Signal	No signal (Insert a shorting plug into the Audio LINE IN terminal)
Measurement point	CN500 (LINE 1) Pin ③
Measuring instrument	Audio level meter (IHF-A weighing filter is used)
Specified value	– 45.5dBs or less

[Check Method]

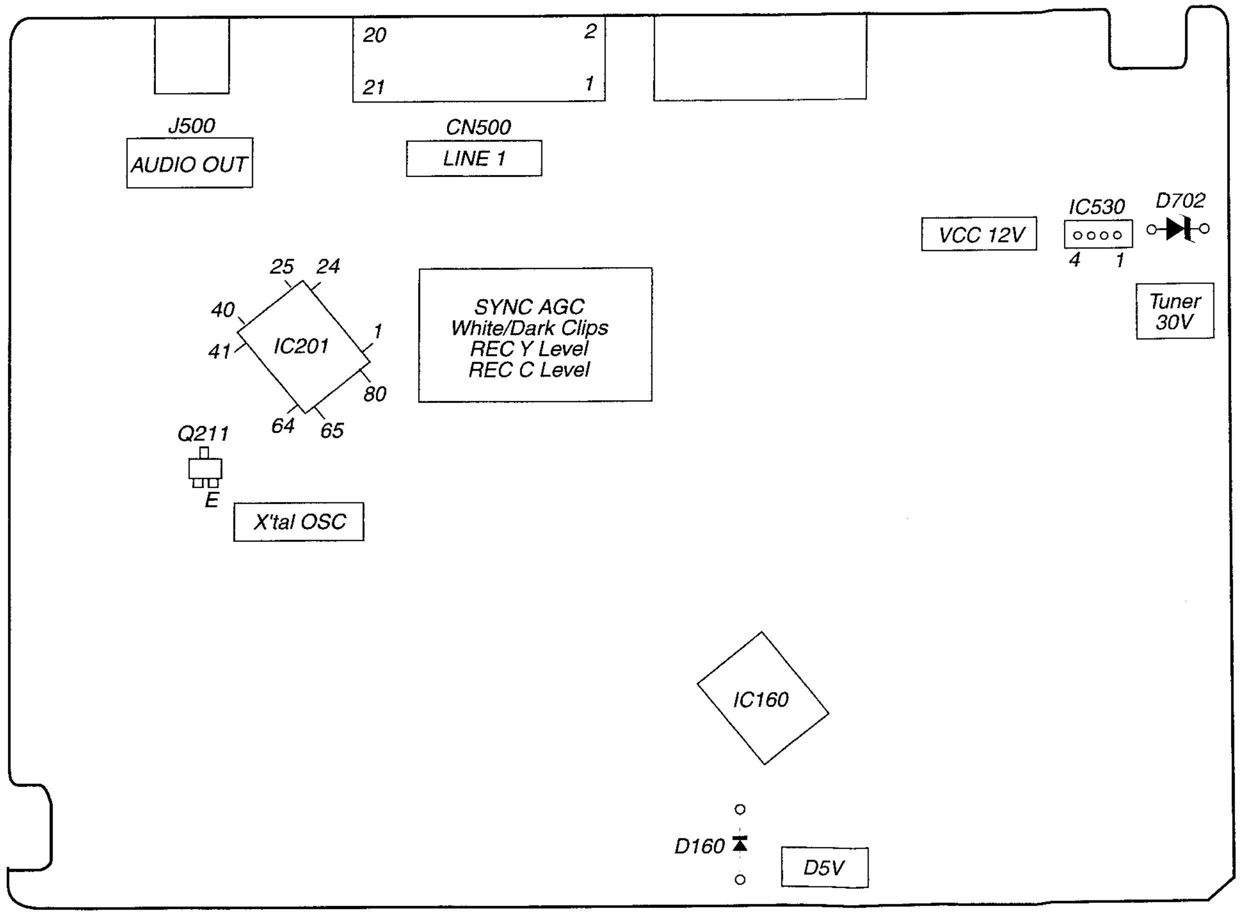
1) Record.
2) Playback recorded portion.
3) Check that noise level is – 45.5dBs or less.

2-6. ADJUSTMENT PARTS LOCATION DIAGRAM

RP-231 BOARD (Conductor side)


1
5
CN261
1
2
CN341
RF/AF
Switching Position

MA-316 BOARD (Conductor side)


20
2
21
1
J500
AUDIO OUT
CN500
LINE 1
VCC 12V
IC530
D702
4
1
Tuner
30V
25
24
40
41
IC201
1
80
64
65
Q211
E
SYNC AGC
White/Dark Clips
REC Y Level
REC C Level
X'tal OSC
IC160
D160
D5V

SECTION 7
REPAIR PARTS LIST

7-1. EXPLODED VIEWS

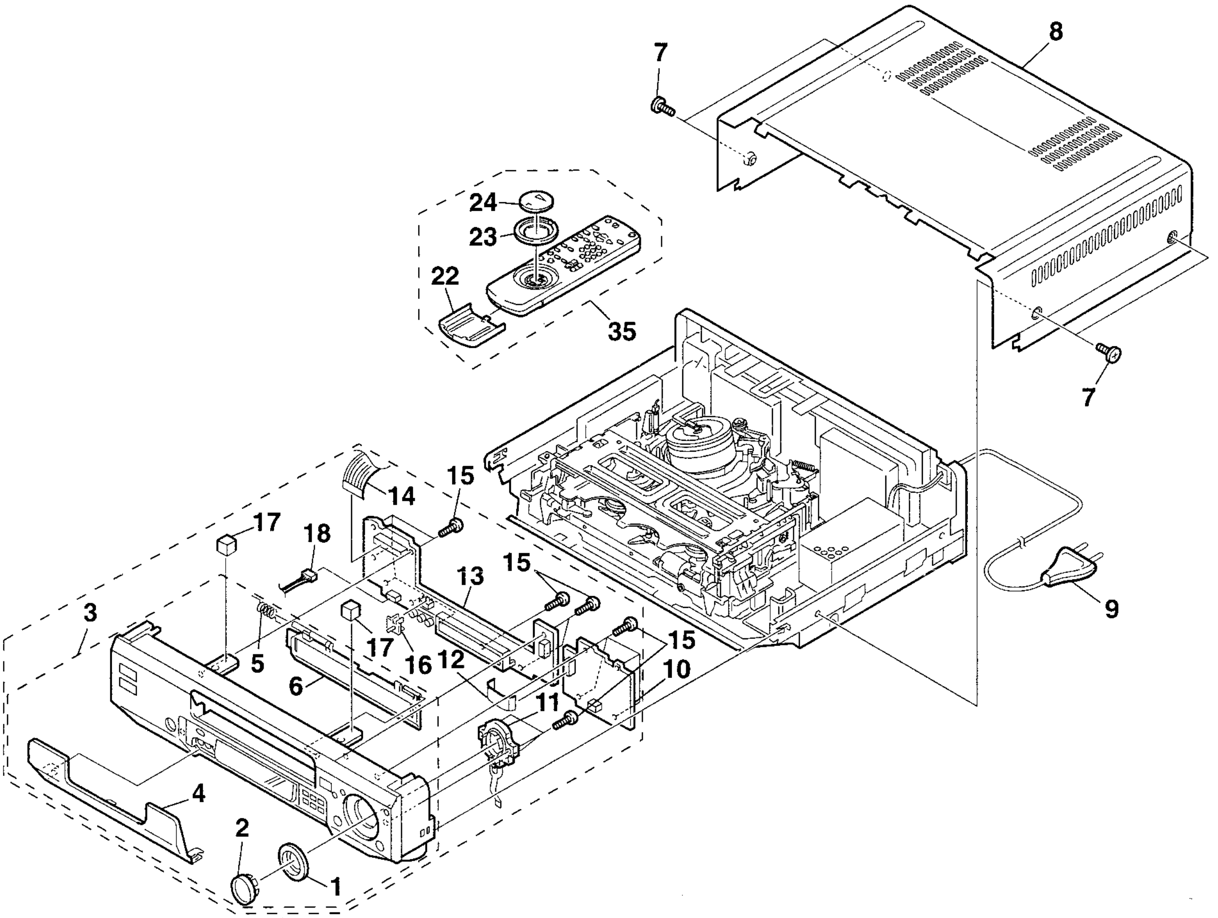
Note:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (#mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

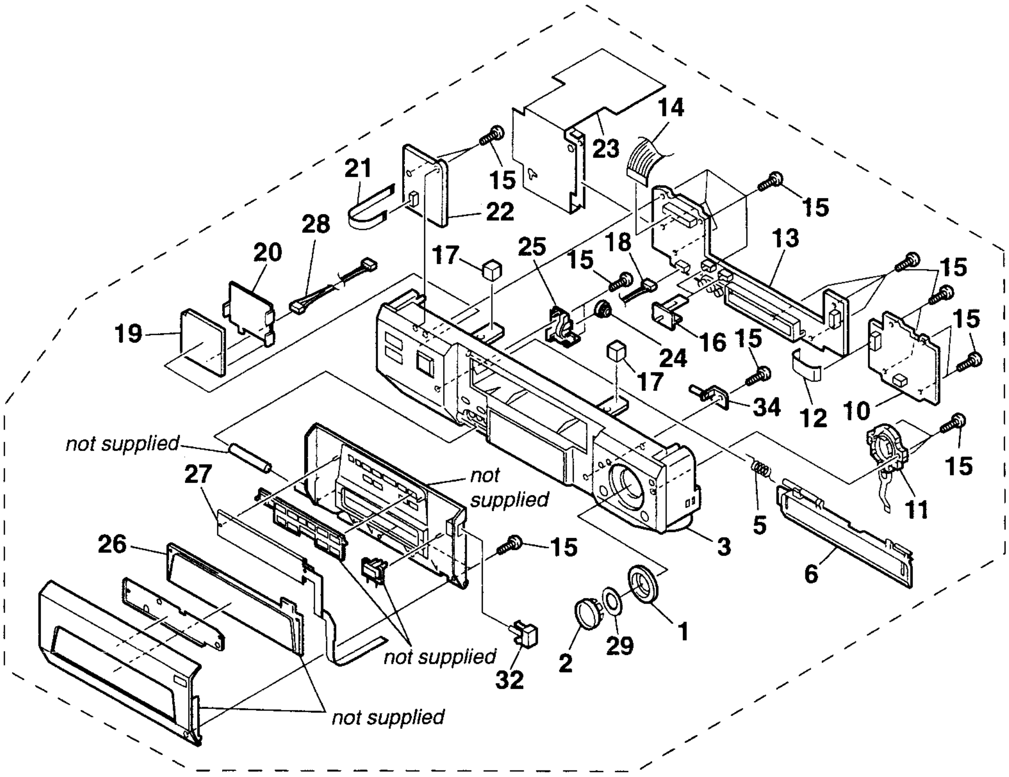
7-1-1. FRONT PANEL ASSEMBLY AND UPPER CASE SECTION



E850, E880, MODEL

Ref. No.	Part No.	Description	Remarks
1	3-979-310-21	RING (AV), JOG	
2	3-979-309-21	BUTTON (AV), CENTER (EXCEPT E850:B)	
2	3-979-309-31	BUTTON (AV), CENTER (E850:B)	
3	X-3948-404-1	PANEL ASSY, FRONT (E850:B)	
3	X-3948-405-1	PANEL ASSY, FRONT (E850:UX)	
3	X-3948-406-1	PANEL ASSY, FRONT (E880)	
4	X-3948-226-1	DOOR ASSY, FRONT	
5	3-953-432-01	SPRING (GE), FL	
6	3-979-302-21	DOOR (AV), CASSETTE	
7	3-363-099-01	SCREW (CASE 3 TP2)	
* 8	3-987-684-21	CASE (BN), UPPER	
⚠ 9	1-782-012-11	CORD, POWER (E850/E880/F900)	
⚠ 9	1-783-931-11	CORD, POWER (F990)	
* 10	A-6794-519-A	DM-73A BOARD, COMPLETE	
11	1-762-844-31	SWITCH, ROTARY	
12	1-783-169-11	CABLE, FLAT (FFD-2)	
* 13	A-6791-603-A	FR-128 BOARD, COMPLETE (E880)	
* 13	A-6791-636-A	FR-128 BOARD, COMPLETE (E850:B)	
* 13	A-6791-638-A	FR-128 BOARD, COMPLETE (E850:UX)	
14	1-783-167-11	CABLE, FLAT (FFM-18)	
15	3-968-554-01	SCREW (WN1411 D2.5 EJOT K25)	
16	3-987-691-01	KNOB, SLIDE	
17	3-978-737-11	CUSHION (FP), RUBBER	
18	1-779-725-11	CONNECTOR, BOARD TO BOARD 5P	
22	3-709-126-01	COVER, BATTERY	
23	3-972-783-21	RING, JOG	
24	3-972-850-01	BUTTON, FUNCTION	
35	1-475-563-41	COMMANDER, STANDARD(RMT-V223C)(E880)	
35	1-475-578-11	COMMANDER, STANDARD(RMT-V222C)	(F900:VC,NP)
35	1-475-578-21	COMMANDER, STANDARD(RMT-V222D)	(F900:UX)
35	1-475-578-31	COMMANDER, STANDARD(RMT-V222E)	(F900:B)
35	1-475-767-11	COMMANDER, STANDARD (RMT-V240)	(E850:UX)
35	1-475-767-21	COMMANDER, STANDARD (RMT-V240A)	(E850:B)
35	1-475-767-31	COMMANDER, STANDARD(RMT-V240B)	(F990:VC,NP)
35	1-475-767-41	COMMANDER, STANDARD(RMT-V240C)	(F990:UX)
35	1-475-767-51	COMMANDER, STANDARD(RMT-V240D)	(F990:B)

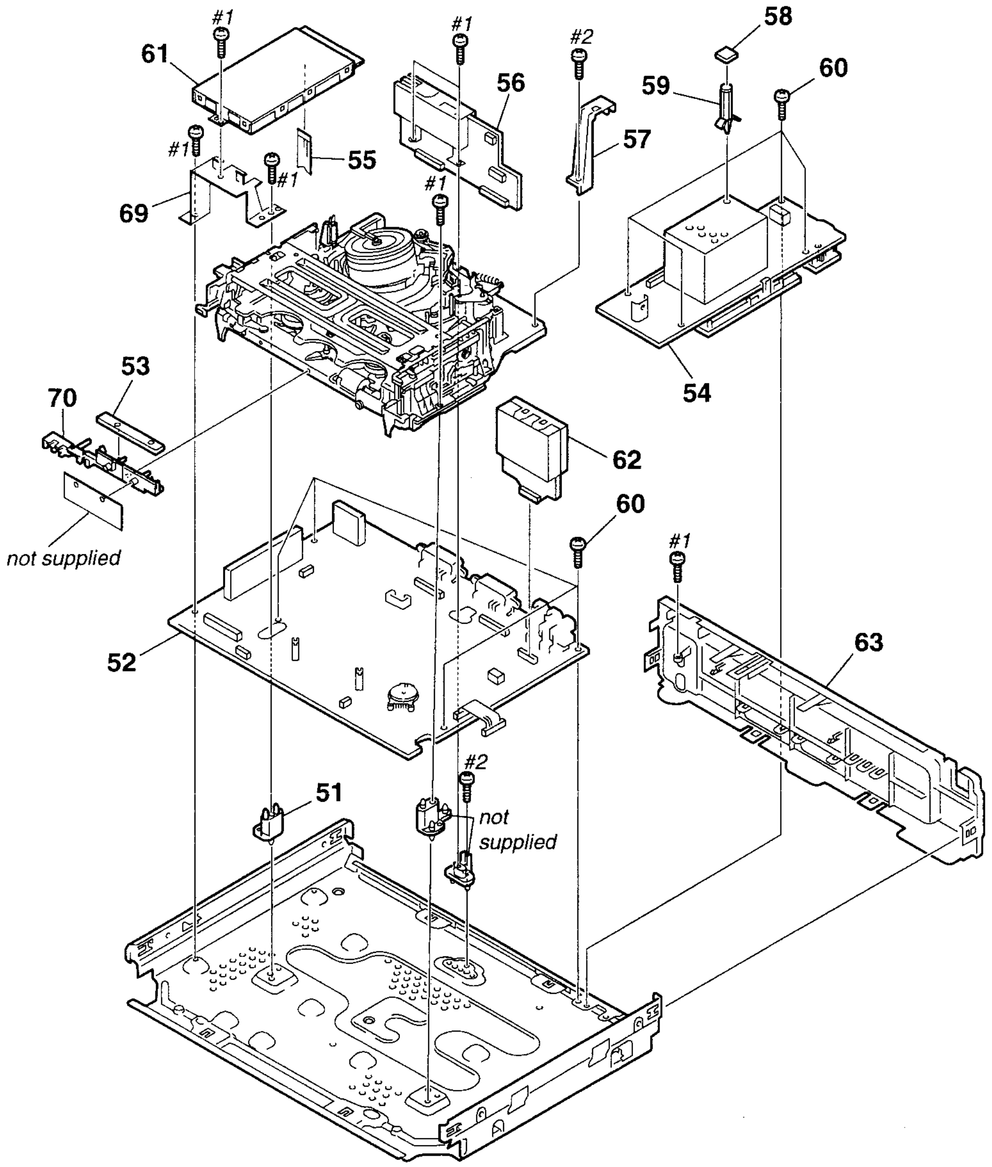
7-1-1. FRONT PANEL ASSEMBLY AND UPPER CASE SECTION (continued)



F900, F990, MODEL

Ref. No.	Part No.	Description	Remarks
1	3-989-330-01	RING, JOG	
2	3-979-309-21	BUTTON (AV), CENTER	(EXCEPT F900:B/F990:B)
2	3-979-309-31	BUTTON (AV), CENTER (F990:B/F900:B)	
3	X-3948-583-1	PANEL ASSY, FRONT (F900:UX)	
3	X-3948-584-1	PANEL ASSY, FRONT (F900:VC)	
3	X-3948-585-1	PANEL ASSY, FRONT (F900:B)	
3	X-3948-586-1	PANEL ASSY, FRONT (F900:NP)	
3	X-3948-587-1	PANEL ASSY, FRONT (F990:UX)	
3	X-3948-588-1	PANEL ASSY, FRONT (F990:VC)	
3	X-3948-589-1	PANEL ASSY, FRONT (F990:B)	
3	X-3948-590-1	PANEL ASSY, FRONT (F990:NP)	
5	3-953-432-01	SPRING (GE), FL	
6	3-979-302-11	DOOR (AV), CASSETTE	
* 10	A-6791-631-A	DM-73 BOARD, COMPLETE (F990)	
* 10	A-6794-519-A	DM-73A BOARD, COMPLETE (F900)	
11	1-762-844-21	SWITCH, ROTARY (F900)	
11	1-762-844-31	SWITCH, ROTARY (F990)	
12	1-783-169-11	CABLE, FLAT (FFD-2)	
* 13	A-6791-615-A	FR-128 BOARD, COMPLETE (F900:VC,NP,UX)	
* 13	A-6791-621-A	FR-128 BOARD, COMPLETE (F900:B)	
* 13	A-6791-630-A	FR-128 BOARD, COMPLETE (F990:VC,NP,UX)	
* 13	A-6791-635-A	FR-128 BOARD, COMPLETE (F990:B)	
14	1-783-167-11	CABLE, FLAT (FFM-18)	
15	3-968-554-01	SCREW (WN1411 D2.5 EJOT K25)	
16	3-050-302-01	KNOB, SLIDE	
17	3-978-737-11	CUSHION (FP), RUBBER	
18	1-779-725-11	CONNECTOR, BOARD TO BOARD 5P	
* 19	A-6794-543-A	AT-24 BOARD, COMPLETE	
20	3-050-303-01	HOLDER, SHIELD	
21	1-777-963-11	CABLE, FLAT (FHM-3) 5P	
* 22	A-6794-542-A	SW-300 BOARD, COMPLETE	
23	3-050-304-01	PLATE (TY), SHIELD	
24	3-973-975-31	DAMPER, OIL	
25	3-050-299-01	HOLDER, DAMPER	
26	1-475-584-11	SWITCH BLOCK, CONTROL (F900:VC,NP,UX)	
26	1-475-584-21	SWITCH BLOCK, CONTROL (F900:B)	
26	1-475-585-11	SWITCH BLOCK, CONTROL (F990:VC,NP,UX)	
26	1-475-585-21	SWITCH BLOCK, CONTROL (F990:B)	
27	3-050-298-11	SHEET, SW (F990:VC,NP,UX)	
27	3-050-298-31	SHEET, SW (F990:B)	
28	1-766-723-21	CONNECTOR, BOARD TO BOAR 3P	
29	3-050-296-11	LENS, GUIDE (F990)	
32	3-051-688-01	CLAW, LOCK	
* 34	X-3948-742-1	PLATE (RIGHT) ASSY, FULCRUM	

7-1-2. CHASSIS SECTION

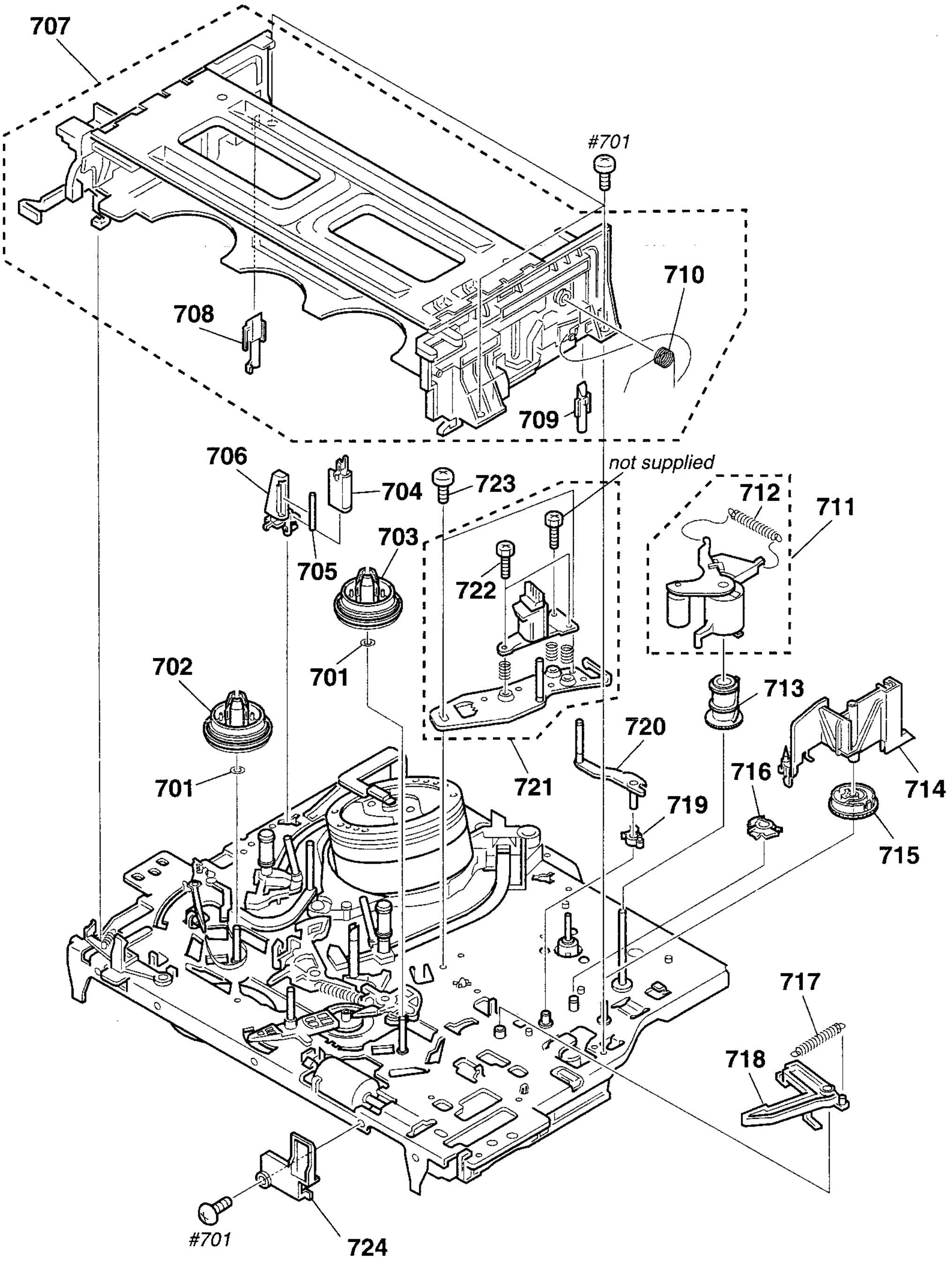


Ref. No.	Part No.	Description	Remarks
51	3-959-381-01	BASE (L), MD	
* 52	A-6791-604-A	MA-316 BOARD, COMPLETE (E880)	
* 52	A-6791-616-A	MA-316 BOARD, COMPLETE (F900:VC)	
* 52	A-6791-619-A	MA-316 BOARD, COMPLETE (F900:NP)	
* 52	A-6791-620-A	MA-316 BOARD, COMPLETE (F900:UX)	
* 52	A-6791-622-A	MA-316 BOARD, COMPLETE (F900:B)	
* 52	A-6791-632-A	MA-316 BOARD, COMPLETE (F990:VC)	
* 52	A-6791-633-A	MA-316 BOARD, COMPLETE (F990:NP)	
* 52	A-6791-634-A	MA-316 BOARD, COMPLETE (F990:UX)	
* 52	A-6791-637-A	MA-316 BOARD, COMPLETE (E850:B)	
* 52	A-6791-639-A	MA-316 BOARD, COMPLETE (E850:UX)	
* 52	A-6791-646-A	MA-316 BOARD, COMPLETE (F990:B)	
* 53	A-6794-544-A	AT-23 BOARD, COMPLETE (F900/F990)	
⚠54	1-468-273-11	POWER BLOCK	
55	1-783-166-11	CABLE, FLAT (FFM-17) (F900/F990)	
* 56	A-6791-531-A	RP-231B BOARD, COMPLETE (E850/E880/F990)	
* 56	A-6791-617-A	RP-231 BOARD, COMPLETE (F900)	
57	3-050-836-01	HOLDER, DNR	
58	3-989-626-01	CUSHION (PS), RUBBER	
59	3-670-570-71	SPACER, SUPPORT	
60	3-970-608-11	SUMITITE (B3), +BV (F900/F990)	
60	3-970-608-21	SUMITITE (B3), +BV (E850/E880)	
* 61	A-6791-618-A	ML-15 BOARD, COMPLETE (F900/F900)	
* 62	A-6791-537-A	SE-69A BOARD, COMPLETE (E850:B/F900:B/F990:B)	
* 62	A-6791-605-A	NR-26 BOARD, COMPLETE (E880/F900:VC,NP,UX/F990:VC,NP,UX)	
* 63	3-987-709-81	PANEL (BN), REAR (E880)	
* 63	3-987-709-91	PANEL (BN), REAR (E850:B)	
* 63	3-987-710-61	PANEL (BN), REAR (F900:VC,NP,B)	
64	3-719-381-01	SCREW (M2X4)	
65	3-974-477-01	WASHER, (GEAR, LIMITTER)	
66	3-977-436-01	WORM	
67	3-977-501-01	PLATE, LUMINOUS	
68	4-921-277-41	SCREW (B2.6X8), TAPPING, BIND	
69	3-050-878-01	HOLDER, ML	
70	3-987-343-11	HOLDER, AN	

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

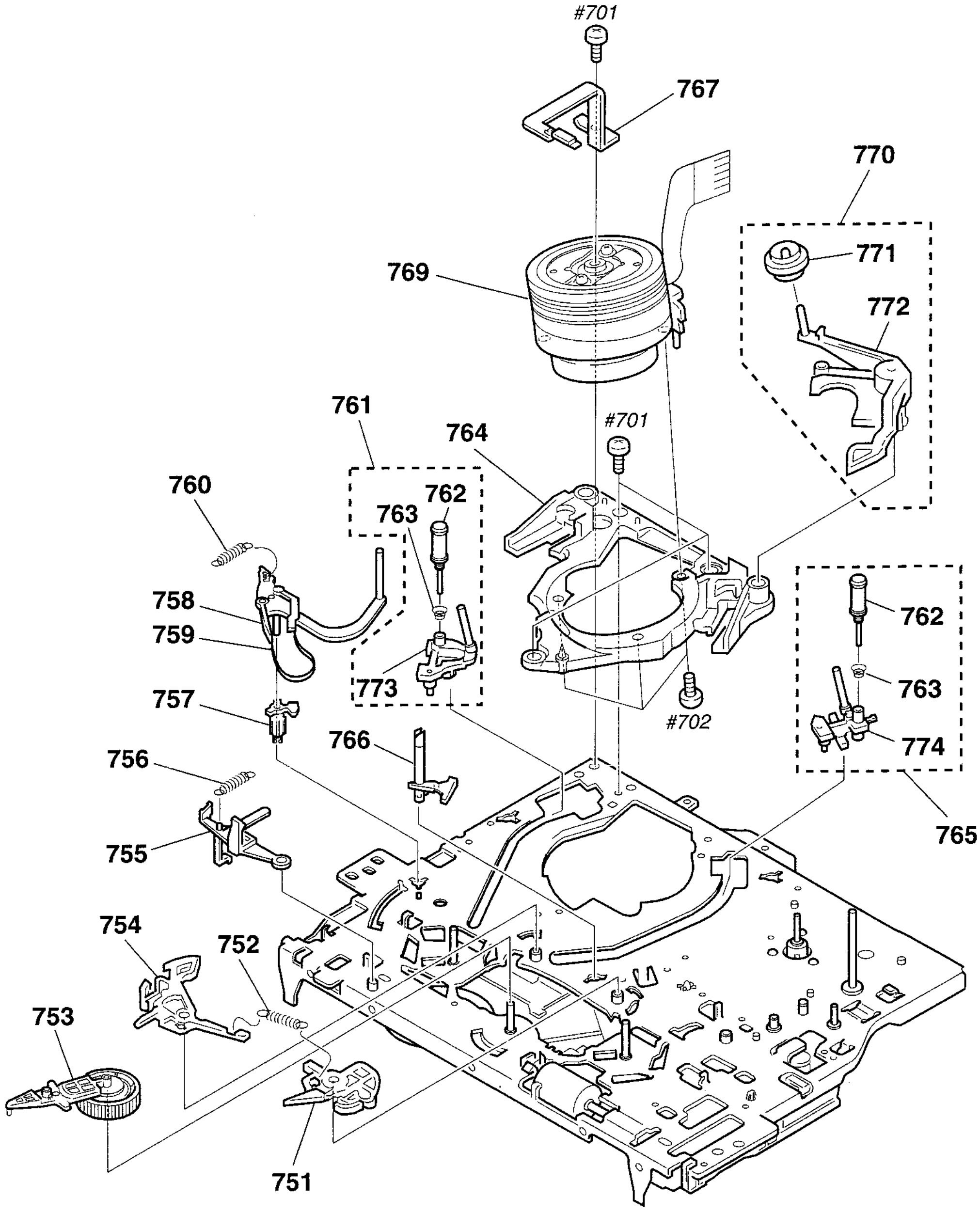
Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

7-1-3. MECHANISM DECK-1


707
#701
710
708
709
706
704
723
not supplied
712
711
703
705
722
702
701
713
720
701
721
716
714
719
715
717
718
#701
724

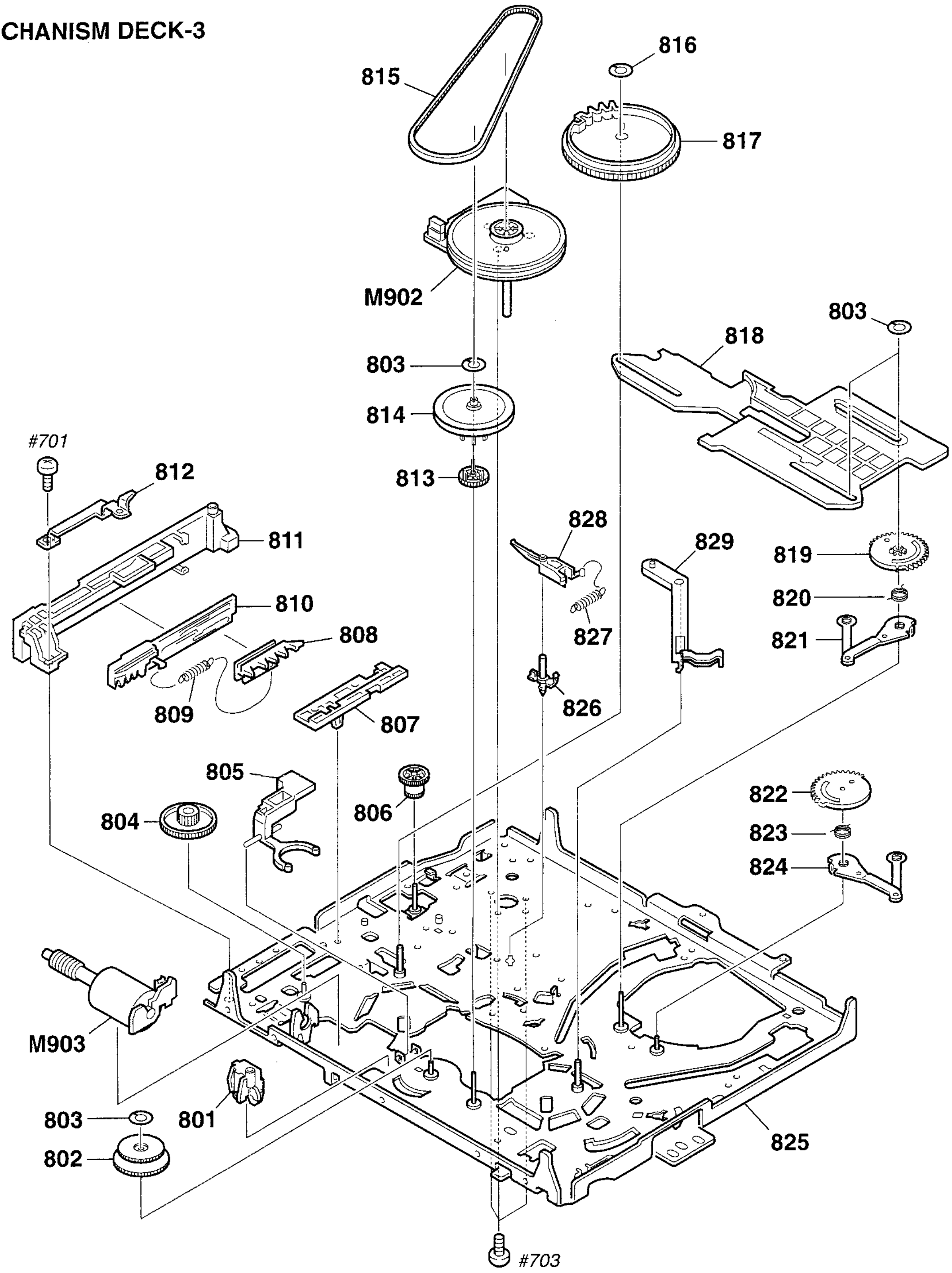
Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
701	3-977-509-01	WASHER, THRUST		713	3-977-447-01	GEAR, ELEVATOR	
702	3-977-507-01	TABLE, REEL (S) (GRAY)		714	3-977-514-01	OPENER, LID	
703	3-977-508-01	TABLE, REEL (T) (BLACK)		715	3-977-441-01	GEAR, PINCH PRESSING	
704	1-500-144-11	HEAD, FE		716	3-977-445-01	GEAR, TG8 ARM DRIVING	
705	3-977-495-01	SHAFT TG2		717	3-977-465-01	SPRING,EXTENSION(RVS BRAKE)	
706	3-977-494-01	HOLDER, FEH		718	X-3947-582-1	ARM ASSY, RVS BRAKE	
707	A-6759-619-C	FL COMPLETE ASSY		719	3-977-446-01	GEAR, TG8 ARM	
708	3-977-535-01	PLATE, LUMINOUS(END SENSOR)		720	X-3947-590-1	TG8 ASSY	
709	3-977-536-01	PLATE, LUMINOUS(TOP SENSOR)		721	A-6759-620-A	HEAD BLOCK ASSY, ACE (TDK)	
710	3-970-471-01	SPRING (DECK OPEN), TORSION		722	3-974-556-01	+ HEXA TT 2.6X9 (TAPER)	
711	A-6759-615-A	PRESS BLOCK ASSY, PINCH		723	3-979-508-01	SCREW	
712	3-958-455-01	SPRING (PINCH), TENSION		724	3-978-485-01	PLATE, GUIDE CASSETTE	

7-1-4. MECHANISM DECK-2


#701
767
770
771
769
772
761
764
#701
760
762
763
758
759
773
762
763
757
#702
766
774
756
765
755
754
752
753
751

Ref. No.	Part No.	Description	Remarks
751	X-3947-581-1	BRAKE ASSY,MAIN(T)	
752	3-977-462-01	SPRING,EXTENTION. (MAIN BRAKE)	
753	X-3947-573-1	ARM ASSY, PENDULUM	
754	X-3947-580-2	BRAKE ASSY, MAIN(S)	
755	3-977-513-02	LEVER, REC. PROOF	
756	3-976-767-01	SPRING, TENS. (REC. PROOF)	
757	3-977-487-01	BOSS, TG1 FULCRUM	
758	X-3947-587-1	TG1 ASSY	
759	X-3947-589-1	BAND ASSY, TG1	
760	3-977-488-01	SPRING (POWER TENSION)	
761	A-6750-324-E	SHUTTLE (S) BLOCK ASSY	
762	X-3944-378-2	ROLLER ASSY, GUIDE	
763	3-965-178-01	SPRING	
764	3-969-632-04	BASE, DRUM	
765	A-6750-325-E	SHUTTLE (T) BLOCK ASSY	
766	3-977-501-01	PLATE, LUMINOUS	
767	X-3943-899-8	GROUND ASSY, SHAFT	
768	2-643-205-01	SCREW	
769	1-759-373-11	DRUM ASSY DZH-86A-R (NP,VC1,VC2)	
769	1-759-557-11	DRUM ASSY DZH-98A-R (B)	
770	A-6746-074-G	ROLLER BLOCK ASSY, HC	
771	X-3947-255-1	ROLLER ASSY, HC	
772	3-975-724-07	ARM, HC	
773	X-3946-855-1	SHUTTLE (S) ASSY	
774	X-3946-856-1	SHUTTLE (T) ASSY	

7-1-5. MECHANISM DECK-3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Ref. No.	Part No.	Description	Remarks
* 801	3-977-437-01	RETAINER,CAM MOTOR	
802	X-3947-584-1	ASSY, REEL DIRECT	
803	3-977-443-01	WASHER, STOPPER	
804	3-977-438-01	WORM - WHEEL	
805	3-977-506-01	ARM, LIMITTER SELECTION	
806	3-977-444-01	GEAR, PINCH TRANSMISSION	
807	3-977-515-01	GUIDE, FL SLIDER	
808	3-977-517-01	PLATE, SLIDE, FL	
809	3-977-519-01	SPRING, TENS. (LIMIT, FL)	
810	3-977-518-02	PLATE, LIMITTER, FL	
811	3-977-516-01	HOLDER, FL SLIDER	
812	3-977-877-01	PLATE, RETAINER	
813	3-977-504-01	GEAR, CLUTCH	
814	X-3947-585-1	GEAR ASSY, PULLEY	
815	3-977-510-01	BELT, RUBBER	
816	3-977-440-01	WASHER, STOPPER	
817	3-977-439-01	GEAR, CAM	
818	3-977-442-01	SLIDER	
819	3-977-455-01	GEAR, LOADING(T)	
820	3-977-456-03	SPRING, TORSION (LOAD T)	
821	X-3947-579-1	LEVER ASSY, LOADING(T)	
822	3-977-451-01	GEAR, LOADING(S)	
823	3-977-452-01	SPRING, TORSION (LOAD S)	
824	X-3947-578-1	LEVER ASSY, LOADING(S)	
825	X-3947-576-2	CHASSIS ASSY, MECHANICAL	
826	3-977-468-01	SHAFT, CAPSTAN BRAKE	
827	3-977-467-02	SPRING, CAP BRAKE	
828	X-3947-583-1	BRAKE ASSY, CAPSTAN	
829	3-977-489-01	ARM, TG1 DRIVING	
830	A-6759-616-A	GEAR BLOCK ASSY, LOADING	
M902	1-698-971-11	MOTOR, DC	
M903	X-3947-577-1	MOTOR ASSY, CAM	

7-2. ELECTRICAL PARTS LIST

Note:

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: μF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: μH
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA... , uPA... , μPA... ,
  uPB... , μPB... , uPC... , μPC... ,
  uPD..., μPD...

Ref. No.	Part No.	Description	Remarks
*	A-6794-544-A	AT-23 BOARD, COMPLETE (F900/F990) **********************	
			(Ref.No.:4,000 series)
		< CAPACITOR >	
C991	1-163-136-00	CERAMIC CHIP 620PF 1% 50V	
		< CONNECTOR >	
CN990	1-564-002-11	PIN, CONNECTOR 3P	
		< RESISTOR >	
R990	1-216-295-91	SHORT 0	
R991	1-216-295-91	SHORT 0	
*	A-6794-543-A	AT-24 BOARD, COMPLETE (F900/F990) **********************	
			(Ref.No.:5,000 series)
		< CAPACITOR >	
C995	1-125-830-91	CERAMIC CHIP 680PF 1% 50V	
C996	1-163-243-11	CERAMIC CHIP 47PF 5% 50V	
		< CONNECTOR >	
CN995	1-564-002-11	PIN, CONNECTOR 3P	
*	A-6794-519-A	DM-73A BOARD, COMPLETE (E850/E880/F900) ***********************	
*	A-6791-631-A	DM-73A BOARD, COMPLETE (F990) ***********************	
			(Ref.No.:2,000 series)
		< CAPACITOR >	
C450	1-124-584-00	ELECT 100uF 20% 10V	(F990)
C451	1-163-038-91	CERAMIC CHIP 0.1uF 25V	(F990)
C452	1-163-227-11	CERAMIC CHIP 10PF 0.5PF 50V	(F990)
		< CONNECTOR >	
CN451	1-784-484-11	CONNECTOR, FFC/FPC 5P	
CN452	1-784-453-11	CONNECTOR, FFC/FPC 11P	
		< DIODE >	
D450	8-719-056-07	DIODE SLR-342MC3F (F990)	
D451	8-719-056-07	DIODE SLR-342MC3F (F990)	
D452	8-719-056-07	DIODE SLR-342MC3F (F990)	
D453	8-719-056-07	DIODE SLR-342MC3F (F990)	
D454	8-719-056-06	DIODE SLR-342DC3F (F990)	
D455	8-719-056-07	DIODE SLR-342MC3F (F990)	
D456	8-719-056-07	DIODE SLR-342MC3F (F990)	
D457	8-719-056-07	DIODE SLR-342MC3F (F990)	
D458	8-719-056-07	DIODE SLR-342MC3F (F990)	
D459	8-719-056-06	DIODE SLR-342DC3F	
		< IC >	
IC450	8-759-366-45	IC NJU3713G(TE2) (F990)	
		< TRANSISTOR >	
Q450	8-729-424-08	TRANSISTOR UN2111 (E850/E880/F900)	
		< RESISTOR >	
R450	1-216-033-00	METAL CHIP 220 5% 1/10W(F990)	
R451	1-216-033-00	METAL CHIP 220 5% 1/10W(F990)	
R452	1-216-033-00	METAL CHIP 220 5% 1/10W(F990)	
R453	1-216-033-00	METAL CHIP 220 5% 1/10W(F990)	
R454	1-216-033-00	METAL CHIP 220 5% 1/10W(F990)	
R455	1-216-033-00	METAL CHIP 220 5% 1/10W(F990)	
R456	1-216-033-00	METAL CHIP 220 5% 1/10W(F990)	
R457	1-216-033-00	METAL CHIP 220 5% 1/10W(F990)	
R458	1-216-033-00	METAL CHIP 220 5% 1/10W(F990)	
R459	1-216-033-00	METAL CHIP 220 5% 1/10W	
R460	1-216-295-91	SHORT 0 (F990)	
R461	1-216-295-91	SHORT 0 (F990)	
R462	1-216-049-91	RES,CHIP 1K 5% 1/10W(F990)	
R463	1-216-049-91	RES,CHIP 1K 5% 1/10W(F990)	
R464	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R465	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R466	1-249-429-11	CARBON 10K 5% 1/4W	
R467	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R468	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R469	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R470	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R471	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R472	1-216-065-91	RES,CHIP 4.7K 5% 1/10W	
		< SWITCH >	
S451	1-762-196-21	SWITCH, TACT (REC)	
S453	1-762-196-21	SWITCH, TACT (REW)	
S457	1-762-196-21	SWITCH, TACT (FF)	
S458	1-762-196-21	SWITCH, TACT (PAUSE)	
S459	1-762-196-21	SWITCH, TACT (JOG)	

Ref. No.	Part No.	Description	Remarks
*	A-6791-603-A	FR-128 BOARD, COMPLETE (E880)	
		**********************	
*	A-6791-615-A	FR-128 BOARD, COMPLETE (F900:VC,NP,UX)	
		**********************	
*	A-6791-621-A	FR-128 BOARD, COMPLETE (F900:B)	
		**********************	
*	A-6791-630-A	FR-128 BOARD, COMPLETE (F990:VC,NP,UX)	
		**********************	
*	A-6791-635-A	FR-128 BOARD, COMPLETE (F990:B)	
		**********************	
*	A-6791-636-A	FR-128 BOARD, COMPLETE (F850:B)	
		**********************	
*	A-6791-638-A	FR-128 BOARD, COMPLETE (E850:UX)	
		**********************	
			(Ref.No.:3,000 series)
	3-966-257-01	HOLDER (B), FL (F990,F900)	
		< BUZZER >	
BZ181	1-529-104-11	BUZZER, PIEZOELECTRIC	
		< CAPACITOR >	
C180	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C188	1-163-104-00	CERAMIC CHIP 30PF 5% 50V	
C190	1-125-705-11	DOUBLE LAYER 0.22F 0 5.5V	
C191	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C192	1-126-916-11	ELECT 1000uF 20% 6.3V	(E850/F900/F990)
C192	1-126-924-11	ELECT 330uF 20% 10V	(E880)
C193	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C196	1-128-057-11	ELECT 330uF 20% 6.3V	(E850/F900/F990)
C196	1-126-916-11	ELECT 1000uF 20% 6.3V	(E880)
C198	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C199	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C200	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C400	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	(E850/E880)
C421	1-165-319-11	CERAMIC CHIP 0.1uF 50V	
C422	1-104-664-11	ELECT 47uF 20% 16V	
C423	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C424	1-165-319-11	CERAMIC CHIP 0.1uF 50V	
C481	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C491	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C493	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C495	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C496	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C497	1-163-263-11	CERAMIC CHIP 330PF 5% 50V	
		< CONNECTOR >	
CN181	1-784-514-11	CONNECTOR, FFC/FPC 35P	
CN400	1-784-453-11	CONNECTOR, FFC/FPC 11P	
CN401	1-691-036-21	PIN, CONNECTOR (PC BOARD) 4P(F900/F990)	
CN402	1-784-484-11	CONNECTOR, FFC/FPC 5P (F900/F990)	
* CN480	1-564-004-11	PIN, CONNECTOR 5P	
		< TRIMMER >	
CT180	1-141-227-00	CAP, TRIMMER 20PF	

Ref. No.	Part No.	Description	Remarks
		< DIODE >	
D186	8-719-200-82	DIODE 11ES2	
D187	8-719-200-82	DIODE 11ES2	
D400	8-719-056-07	DIODE SLR-342MC3F (E850/E880)	
D420	8-719-110-08	DIODE RD8.2ES-B2	
D480	8-719-109-97	DIODE RD6.8ES-B2	
D481	8-719-108-12	DIODE RD9.1E-W	
D490	8-719-108-12	DIODE RD9.1E-W	
D491	8-719-108-12	DIODE RD9.1E-W	
		< FERRITE BEAD >	
FB400	1-414-234-11	INDUCTOR CHIP 0UH (F900/F990)	
FB400	1-216-295-91	SHORT 0 (E850/E880)	
FB401	1-414-234-11	INDUCTOR CHIP 0UH (F900/F990)	
FB401	1-216-295-91	SHORT 0 (E850/E880)	
FB402	1-414-234-11	INDUCTOR CHIP 0UH (F900/F990)	
FB402	1-216-295-91	SHORT 0 (E850/E880)	
FB403	1-414-234-11	INDUCTOR CHIP 0UH (F900/F990)	
FB403	1-216-295-91	SHORT 0 (E850/E880)	
FB404	1-414-234-11	INDUCTOR CHIP 0UH (F900/F990)	
FB404	1-216-295-91	SHORT 0 (E850/E880)	
FB405	1-414-234-11	INDUCTOR CHIP 0UH (F900/F990)	
FB405	1-216-295-91	SHORT 0 (E850/E880)	
FB406	1-414-234-11	INDUCTOR CHIP 0UH (F900/F990)	
FB406	1-216-295-91	SHORT 0 (E850/E880)	
FB407	1-414-234-11	INDUCTOR CHIP 0UH (F900/F990)	
FB407	1-216-295-91	SHORT 0 (E850/E880)	
FB408	1-414-234-11	INDUCTOR CHIP 0UH (F900/F990)	
FB408	1-216-295-91	SHORT 0 (E850/E880)	
FB409	1-414-234-11	INDUCTOR CHIP 0UH (F900/F990)	
FB409	1-216-295-91	SHORT 0 (E850/E880)	
FB410	1-414-234-11	INDUCTOR CHIP 0UH (F900/F990)	
FB410	1-216-295-91	SHORT 0 (E850/E880)	
		< IC >	
IC180	8-759-537-74	IC S579C15PJ-VSX9354 (F900:B)	
IC180	8-759-537-73	IC S579C15PJ-VSX9353 (F900:VC,NP,UX)	
IC180	8-759-483-35	IC S579258PJ (E850:B/F990:B)	
IC180	8-759-483-34	IC S579257PJ (E850:UX/F990:VC,NP,UX)	
IC180	8-759-549-75	IC S579265PJ (E880)	
IC182	8-759-432-34	IC ST24W16FM6TR	
IC183	8-759-248-87	IC MM1256XF-BE	
IC400	8-749-011-05	IC GP1U28X (E850/E880)	
IC420	8-759-438-82	IC uPD16311GC-AB6	
		< JACK >	
J480	1-580-845-11	JACK, PIN 3P (LINE 2 IN)	
		< JUMPER RESISTOR >	
JR101	1-216-295-91	SHORT 0	
JR102	1-216-295-91	SHORT 0	
JR103	1-216-295-91	SHORT 0 (E880)	
JR104	1-216-296-91	SHORT 0	
JR105	1-216-296-91	SHORT 0	
JR106	1-216-296-91	SHORT 0	
JR107	1-216-296-91	SHORT 0	
JR108	1-216-296-91	SHORT 0	
JR109	1-216-296-91	SHORT 0	
JR110	1-216-296-91	SHORT 0	

Ref. No.	Part No.	Description				Remarks
JR111	1-216-295-91	SHORT	0			
JR181	1-216-295-91	SHORT	0			
JR191	1-216-295-91	SHORT	0			
JR192	1-216-295-91	SHORT	0			
JS181	1-216-295-91	SHORT	0			
JS402	1-216-295-91	SHORT	0	(F990)		
JS490	1-216-295-91	SHORT	0			
		< COIL >				
L182	1-414-934-21	INDUCTOR	10uH			
		< FLUORECENT INDICATOR >				
ND420	1-517-745-21	TUBE, FLUORESCENT INDICATOR				
		< TRANSISTOR >				
Q400	8-729-421-19	TRANSISTOR	UN2213 (E850/E880)			
		< RESISTOR >				
R180	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R181	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R182	1-216-295-91	SHORT	0			
R183	1-216-295-91	SHORT	0			
R184	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R185	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R186	1-216-041-00	METAL CHIP	470	5%	1/10W	
R187	1-216-041-00	METAL CHIP	470	5%	1/10W	
R188	1-216-049-91	RES,CHIP	1K	5%	1/10W	
R189	1-216-041-00	METAL CHIP	470	5%	1/10W	(F900/F990)
R190	1-249-417-11	CARBON	1K	5%	1/4W	F
R191	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R192	1-216-049-91	RES,CHIP	1K	5%	1/10W	
R193	1-216-073-00	METAL CHIP	10K	5%	1/10W	(F900/F990)
R194	1-216-041-00	METAL CHIP	470	5%	1/10W	(F900/F990)
R195	1-216-049-91	RES,CHIP	1K	5%	1/10W	
R196	1-216-049-91	RES,CHIP	1K	5%	1/10W	
R197	1-216-049-91	RES,CHIP	1K	5%	1/10W	
R198	1-216-049-91	RES,CHIP	1K	5%	1/10W	
R199	1-216-037-00	METAL CHIP	330	5%	1/10W	
R201	1-216-295-91	SHORT	0			
R202	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R203	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R204	1-218-179-11	RES,CHIP	10M	5%	1/10W	
R205	1-216-041-00	METAL CHIP	470	5%	1/10W	(F900/F990)
R400	1-216-029-00	METAL CHIP	150	5%	1/10W	(E850/E880)
R401	1-216-089-91	RES,CHIP	47K	5%	1/10W	(E850/E880)
R402	1-216-065-91	RES,CHIP	4.7K	5%	1/10W	(E850/E880)
R403	1-216-095-00	METAL CHIP	82K	5%	1/10W	(F900/F990)
R403	1-216-073-00	METAL CHIP	10K	5%	1/10W	(E850/E880)
R404	1-216-095-00	METAL CHIP	82K	5%	1/10W	(F900/F990)
R404	1-216-073-00	METAL CHIP	10K	5%	1/10W	(E850/E880)
R405	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R406	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R407	1-216-073-00	METAL CHIP	10K	5%	1/10	
R408	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	(E850/E880)
R409	1-216-065-91	RES,CHIP	4.7K	5%	1/10W	(E850/E880)
R410	1-216-073-00	METAL CHIP	10K	5%	1/10W	(E850/E880)
R411	1-216-081-00	METAL CHIP	22K	5%	1/10W	(E850/E880)
R412	1-216-075-00	METAL CHIP	12K	5%	1/10W	(F990)
R413	1-216-073-00	METAL CHIP	10K	5%	1/10W	(F990)
R414	1-216-081-00	METAL CHIP	22K	5%	1/10W	(F990)
R415	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R416	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R417	1-216-295-91	SHORT	0			
R418	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R421	1-216-295-91	SHORT	0			
R422	1-216-049-91	RES,CHIP	1K	5%	1/10W	
R423	1-216-049-91	RES,CHIP	1K	5%	1/10W	
R424	1-216-049-91	RES,CHIP	1K	5%	1/10W	
R425	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R426	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R427	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R428	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R429	1-216-065-91	RES,CHIP	4.7K	5%	1/10W	
R430	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R480	1-216-022-00	METAL CHIP	75	5%	1/10W	
R481	1-216-295-91	SHORT	0			
R490	1-216-295-91	SHORT	0			
R491	1-216-295-91	SHORT	0			
R492	1-216-035-00	METAL CHIP	270	5%	1/10W	
R493	1-216-089-91	RES,CHIP	47K	5%	1/10W	
R494	1-216-295-91	SHORT	0			
		< SWITCH >				
S400	1-762-196-21	SWITCH, TACT (ON/STANDBY)(E850/E880)				
S401	1-762-196-21	SWITCH, TACT (PROGRAM/TRACKING:+)				(E850/E880)
S402	1-762-196-21	SWITCH, TACT (AUTO SET UP)(E850/E880)				
S404	1-762-196-21	SWITCH, TACT (PROGRAM/TRACKING:-)				(E850/E880)
S406	1-762-196-21	SWITCH, TACT (QUICK TIMER)(E850/E880)				
S407	1-762-196-21	SWITCH, TACT (EJECT)				
S408	1-762-196-21	SWITCH, TACT (AUDIO DUB)(E850/E880)				
S409	1-762-196-21	SWITCH, TACT (DNR)(E880)				
S410	1-762-171-11	SWITCH, SLIDE (COMMANDER) (F990)				
S411	1-572-837-11	SWITCH, SLIDE (POWER SAVE)(F900/F990)				
S411	1-571-588-31	SWITCH, SLIDE (POWER SAVE)(E850/E880)				
		< VIBRATOR >				
X180	1-760-014-11	VIBRATOR, CERAMIC 20MHz				
X181	1-579-463-11	VIBRATOR, CRYSTAL 32.768kHz				

Ref. No.	Part No.	Description			Remarks
*	A-6791-604-A	MA-316 BOARD, COMPLETE (E880)			
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*	A-6791-616-A	MA-316 BOARD, COMPLETE (F900:VC)			
		************************			
*	A-6791-619-A	MA-316 BOARD, COMPLETE (F900:NP)			
		************************			
*	A-6791-620-A	MA-316 BOARD, COMPLETE (F900:UX)			
		************************			
*	A-6791-622-A	MA-316 BOARD, COMPLETE (F900:B)			
		************************			
*	A-6791-632-A	MA-316 BOARD, COMPLETE (F990:VC)			
		************************			
*	A-6791-633-A	MA-316 BOARD, COMPLETE (F990:NP)			
		************************			
*	A-6791-634-A	MA-316 BOARD, COMPLETE (F990:UX)			
		************************			
*	A-6791-637-A	MA-316 BOARD, COMPLETE (E850:B)			
		************************			
*	A-6791-639-A	MA-316 BOARD, COMPLETE (E850:UX)			
		************************			
*	A-6791-646-A	MA-316 BOARD, COMPLETE (F990:B)			
		************************			
					(Ref.No.:2,000 series)
	1-558-924-21	CABLE, PIN			
*	3-960-273-01	SPACER, TOP END			
*	3-960-274-01	SPACER, LED			
		< CAPACITOR >			
C100	1-128-057-11	ELECT	330uF	20%	6.3V
C101	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C102	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C103	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C104	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C105	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C107	1-130-489-00	MYLAR	0.033uF	5%	50V
C108	1-137-441-11	FILM	0.027uF	5%	50V
C109	1-126-157-11	ELECT	10uF	20%	16V
C130	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C131	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C132	1-124-589-11	ELECT	47uF	20%	16V
C134	1-124-463-00	ELECT	0.1uF	20%	50V
C150	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C159	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C160	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C161	1-124-589-11	ELECT	47uF	20%	16V
C162	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C164	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C165	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C166	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C167	1-124-589-11	ELECT	47uF	20%	16V
C170	1-126-154-11	ELECT	47uF	20%	6.3V
C172	1-164-346-11	CERAMIC CHIP	1uF		16V
C173	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C201	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C202	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C204	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C205	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C206	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C207	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C208	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C209	1-128-131-11	ELECT	22uF	20%	50V
C210	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C211	1-163-237-11	CERAMIC CHIP	27PF	5%	50V

Ref. No.	Part No.	Description			Remarks
C212	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C213	1-163-257-11	CERAMIC CHIP	180PF	5%	50V
C214	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C217	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C219	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C220	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C222	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C223	1-126-154-11	ELECT	47uF	20%	6.3V
C224	1-162-306-11	CERAMIC	0.01uF	20%	16V
C226	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C227	1-163-031-11	CERAMIC CHIP	0.01uF		50V
					(E880/F900:VC,NP,UX/F990:VC,NP,UX)
C228	1-126-157-11	ELECT	10uF	20%	16V
C229	1-162-306-11	CERAMIC	0.01uF	20%	16V
C230	1-124-589-11	ELECT	47uF	20%	16V
C231	1-126-157-11	ELECT	10uF	20%	16V
C232	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C233	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C234	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C235	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C236	1-126-160-11	ELECT	1uF	20%	50V
C237	1-163-031-11	CERAMIC CHIP	0.01uF		50V
					(E850/F900:B/F990:B)
C238	1-162-306-11	CERAMIC	0.01uF	20%	16V
C239	1-124-584-00	ELECT	100uF	20%	10V
C240	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C241	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C242	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C243	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C244	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V
C245	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C246	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C247	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C248	1-163-031-11	CERAMIC CHIP	0.01uF		50V
					(E850:B/E880/F900:B/F990:B)
C249	1-126-154-11	ELECT	47uF	20%	6.3V
C250	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C251	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C252	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C253	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C254	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C255	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C257	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C262	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
					(F900/F990)
C301	1-164-159-11	CERAMIC	0.1uF		50V
C302	1-126-154-11	ELECT	47uF	20%	6.3V
C305	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C306	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C307	1-126-157-11	ELECT	10uF	20%	16V
C308	1-124-589-11	ELECT	47uF	20%	16V
C309	1-126-163-11	ELECT	4.7uF	20%	50V
C310	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C311	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C312	1-137-370-11	FILM	0.01uF	5%	50V
C313	1-126-157-11	ELECT	10uF	20%	16V
C314	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C315	1-126-160-11	ELECT	1uF	20%	50V
C317	1-126-163-11	ELECT	4.7uF	20%	50V

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Ref. No.	Part No.	Description	Remarks
C318	1-124-589-11	ELECT 47uF 20% 16V	
C361	1-126-960-11	ELECT 1uF 20% 50V	
C362	1-126-960-11	ELECT 1uF 20% 50V	
C363	1-126-960-11	ELECT 1uF 20% 50V	
C364	1-126-960-11	ELECT 1uF 20% 50V	
C365	1-126-960-11	ELECT 1uF 20% 50V	
C366	1-126-960-11	ELECT 1uF 20% 50V	
C369	1-126-964-11	ELECT 10uF 20% 50V	
C370	1-126-964-11	ELECT 10uF 20% 50V	
C371	1-126-964-11	ELECT 10uF 20% 50V	
C372	1-126-964-11	ELECT 10uF 20% 50V	
C373	1-126-964-11	ELECT 10uF 20% 50V	
C374	1-126-960-11	ELECT 1uF 20% 50V	
C375	1-164-489-11	CERAMIC CHIP 0.22uF 10% 16V	
C376	1-163-016-00	CERAMIC CHIP 0.0039uF 10% 50V	
C377	1-126-967-11	ELECT 47uF 20% 50V	
C378	1-126-964-11	ELECT 10uF 20% 50V	
C379	1-126-961-11	ELECT 2.2uF 20% 50V	
C380	1-126-964-11	ELECT 10uF 20% 50V	
C381	1-126-967-11	ELECT 47uF 20% 50V	
C382	1-163-016-00	CERAMIC CHIP 0.0039uF 10% 50V	
C383	1-164-489-11	CERAMIC CHIP 0.22uF 10% 16V	
C384	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C385	1-126-933-11	ELECT 100uF 20% 16V	
C386	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C390	1-126-960-11	ELECT 1uF 20% 50V	
C391	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C392	1-126-960-11	ELECT 1uF 20% 50V	(E850:B/E880/F900:VC,NP,B/F990)
C393	1-126-960-11	ELECT 1uF 20% 50V	(E850:B/E880/F900:VC,NP,B/F990)
C394	1-126-960-11	ELECT 1uF 20% 50V	
C395	1-126-960-11	ELECT 1uF 20% 50V	
C500	1-163-017-00	CERAMIC CHIP 0.0047uF 5% 50V	
C501	1-163-017-00	CERAMIC CHIP 0.0047uF 5% 50V	
C503	1-163-031-11	CERAMIC CHIP 0.01uF 50V	(E880/F990)
C504	1-126-935-11	ELECT 470uF 20% 6.3V	(E880/F990)
C510	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C511	1-104-664-11	ELECT 47uF 20% 16V	
C512	1-104-664-11	ELECT 47uF 20% 16V	
C513	1-126-935-11	ELECT 470uF 20% 6.3V	
C530	1-104-664-11	ELECT 47uF 20% 16V	
C531	1-107-725-11	CERAMIC CHIP 0.1uF 10% 16V	
C532	1-126-933-11	ELECT 100uF 20% 16V	
C541	1-124-584-00	ELECT 100uF 20% 10V	
C542	1-107-725-11	CERAMIC CHIP 0.1uF 10% 16V	
C543	1-107-725-11	CERAMIC CHIP 0.1uF 10% 16V	
C544	1-107-725-11	CERAMIC CHIP 0.1uF 10% 16V	
C545	1-164-489-11	CERAMIC CHIP 0.22uF 10% 16V	(E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
C546	1-107-725-11	CERAMIC CHIP 0.1uF 10% 16V	(E850B/E880/F900:VC,NP,B/F990:VC,NP,B)
C547	1-107-725-11	CERAMIC CHIP 0.1uF 10% 16V	(E850:B/E880/F900:VC,NP,B/F990)
C571	1-163-017-00	CERAMIC CHIP 0.0047uF 5% 50V	
C572	1-126-964-11	ELECT 10uF 20% 50V	(E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
C573	1-126-964-11	ELECT 10uF 20% 50V	(E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
C660	1-163-239-11	CERAMIC CHIP 33PF 5% 50V	(E850:B/E880/F900:B/F990:B)
C661	1-104-664-11	ELECT 47uF 20% 16V	
C662	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C663	1-107-725-11	CERAMIC CHIP 0.1uF 10% 16V	
C665	1-104-664-11	ELECT 47uF 20% 16V	
C667	1-164-505-11	CERAMIC CHIP 2.2uF 16V	
C668	1-163-239-11	CERAMIC CHIP 33PF 5% 50V	
C669	1-163-239-11	CERAMIC CHIP 33PF 5% 50V	
C670	1-164-505-11	CERAMIC CHIP 2.2uF 16V	
C671	1-163-227-11	CERAMIC CHIP 10PF 0.5PF 50V	
C672	1-163-235-11	CERAMIC CHIP 22PF 5% 50V	
C673	1-163-235-11	CERAMIC CHIP 22PF 5% 50V	
C674	1-104-664-11	ELECT 47uF 20% 16V	
C675	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C676	1-163-021-91	CERAMIC CHIP 0.01uF 10% 50V	
C677	1-126-960-11	ELECT 1uF 20% 50V	
C678	1-126-961-11	ELECT 2.2uF 20% 50V	
C679	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C680	1-163-139-00	CERAMIC CHIP 820PF 5% 50V	
C681	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C682	1-109-982-11	CERAMIC CHIP 1uF 10% 10V	
C701	1-126-964-11	ELECT 10uF 20% 50V	
C704	1-126-964-11	ELECT 10uF 20% 50V	
C705	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C708	1-104-664-11	ELECT 47uF 20% 16V	
C709	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C710	1-126-965-11	ELECT 22uF 20% 50V	
C730	1-126-964-11	ELECT 10uF 20% 50V	
C731	1-126-964-11	ELECT 10uF 20% 50V	
C752	1-126-933-11	ELECT 100uF 20% 16V	
C753	1-107-725-11	CERAMIC CHIP 0.1uF 10% 16V	
C755	1-126-935-11	ELECT 470uF 20% 6.3V	
C820	1-163-017-00	CERAMIC CHIP 0.0047uF 5% 50V	
C821	1-163-017-00	CERAMIC CHIP 0.0047uF 5% 50V	
C822	1-163-003-11	CERAMIC CHIP 330PF 10% 50V	
C823	1-163-003-11	CERAMIC CHIP 330PF 10% 50V	
C824	1-126-964-11	ELECT 10uF 20% 50V	
C825	1-126-964-11	ELECT 10uF 20% 50V	
C850	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C851	1-126-157-11	ELECT 10uF 20% 16V	
C852	1-164-161-11	CERAMIC CHIP 0.0022uF 10% 100V	
C853	1-163-989-11	CERAMIC CHIP 0.033uF 10% 25V	
C855	1-164-489-11	CERAMIC CHIP 0.22uF 10% 16V	
C856	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C893	1-163-038-91	CERAMIC CHIP 0.1uF 25V	(E850/F990)
C894	1-124-589-11	ELECT 47uF 20% 16V	(E850/F990)
		< CONNECTOR >	
CN101	1-779-724-11	CONNECTOR, BOARD TO BOARD 5P	
CN102	1-779-723-11	CONNECTOR, BOARD TO BOARD 9P	
CN104	1-766-716-11	CONNECTOR, BOARD TO BOARD 3P	
* CN161	1-564-004-11	PIN, CONNECTOR 5P	
CN164	1-784-514-11	CONNECTOR, FFC/FPC 35P	

Ref. No.	Part No.	Description	Remarks
CN165	1-506-469-11	PIN, CONNECTOR 4P	
CN166	1-784-496-11	CONNECTOR, FFC/FPC 17P (F900/F990)	
CN305	1-573-847-11	CONNECTOR, BOARD TO BOARD 15P	
* CN306	1-766-718-21	CONNECTOR, BOARD TO BOARD 17P	
CN308	1-573-843-11	CONNECTOR, BOARD TO BOARD 11P (E880/F900:VC,NP,UX/F990:VC,NP,UX)	
CN500	1-784-415-11	CONNECTOR, SQUARE TYPE 21P (LINE/(TV))	
CN570	1-784-415-11	CONNECTOR, SQUARE TYPE 21P (DECODER/LINE 3 IN)	
CN600	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P	
		< DIODE >	
D102	8-719-048-26	DIODE GL528V1	
D107	8-719-911-19	DIODE 1SS119	
D108	8-719-200-82	DIODE 11ES2	
D131	8-719-200-82	DIODE 11ES2	
D132	8-719-200-82	DIODE 11ES2	
D160	8-719-200-82	DIODE 11ES2	
D500	8-719-109-97	DIODE RD6.8ES-B2	
D501	8-719-109-97	DIODE RD6.8ES-B2	
D502	8-719-109-97	DIODE RD6.8ES-B2	
D503	8-719-109-97	DIODE RD6.8ES-B2	
D504	8-719-109-97	DIODE RD6.8ES-B2	
D505	8-719-109-97	DIODE RD6.8ES-B2	
D506	8-719-109-97	DIODE RD6.8ES-B2	
D507	8-719-109-97	DIODE RD6.8ES-B2	
D508	8-719-109-97	DIODE RD6.8ES-B2	
D510	8-719-109-97	DIODE RD6.8ES-B2	
D511	8-719-109-97	DIODE RD6.8ES-B2	
D512	8-719-921-86	DIODE MTZJ-13	
D513	8-719-109-97	DIODE RD6.8ES-B2	
D514	8-719-109-97	DIODE RD6.8ES-B2	
D515	8-719-109-97	DIODE RD6.8ES-B2	
D516	8-719-109-97	DIODE RD6.8ES-B2	
D517	8-719-108-12	DIODE RD9.1E-W	
D518	8-719-108-12	DIODE RD9.1E-W	
D519	8-719-108-12	DIODE RD9.1E-W	
D540	8-719-109-97	DIODE RD6.8ES-B2	
D541	8-719-109-97	DIODE RD6.8ES-B2	
D542	8-719-109-97	DIODE RD6.8ES-B2 (E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)	
D543	8-719-109-97	DIODE RD6.8ES-B2	
D544	8-719-109-97	DIODE RD6.8ES-B2	
D570	8-719-109-97	DIODE RD6.8ES-B2	
D571	8-719-109-97	DIODE RD6.8ES-B2	
D572	8-719-109-97	DIODE RD6.8ES-B2	
D573	8-719-109-97	DIODE RD6.8ES-B2	
D574	8-719-109-97	DIODE RD6.8ES-B2	
D575	8-719-109-97	DIODE RD6.8ES-B2	
D576	8-719-109-97	DIODE RD6.8ES-B2	
D577	8-719-109-97	DIODE RD6.8ES-B2	
D578	8-719-109-97	DIODE RD6.8ES-B2	
D579	8-719-109-97	DIODE RD6.8ES-B2	
D580	8-719-109-97	DIODE RD6.8ES-B2	
D610	8-719-200-82	DIODE 11ES2 (E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)	
D660	8-719-911-19	DIODE 1SS119	
D661	8-719-911-19	DIODE 1SS119	
D663	8-719-911-19	DIODE 1SS119	
D702	8-719-982-26	DIODE MTZJ-33B	
D750	8-719-200-82	DIODE 11ES2	
D800	8-719-911-19	DIODE 1SS119	
D890	8-719-109-97	DIODE RD6.8ES-B2 (E850/F990)	
D891	8-719-109-97	DIODE RD6.8ES-B2 (E850/F990)	
D892	8-719-109-97	DIODE RD6.8ES-B2 (E850/F990)	
		< FILTER >	
FL500	1-236-163-11	ENCAPSULATED COMPONENT	
FL501	1-236-163-11	ENCAPSULATED COMPONENT	
FL502	1-236-163-11	ENCAPSULATED COMPONENT	
FL503	1-236-163-11	ENCAPSULATED COMPONENT	
FL504	1-236-163-11	ENCAPSULATED COMPONENT	
FL505	1-236-163-11	ENCAPSULATED COMPONENT	
FL506	1-236-163-11	ENCAPSULATED COMPONENT (F990)	
FL507	1-236-163-11	ENCAPSULATED COMPONENT (F990)	
FL570	1-236-163-11	ENCAPSULATED COMPONENT	
FL571	1-236-163-11	ENCAPSULATED COMPONENT	
FL572	1-236-163-11	ENCAPSULATED COMPONENT	
FL573	1-236-163-11	ENCAPSULATED COMPONENT	
		< IC >	
IC100	8-759-702-02	IC NJM062M	
IC141	8-759-100-93	IC UPC393G2	
IC160	8-752-888-63	IC CXP87852-026Q (F900/F990)	
IC160	8-752-891-51	IC CXP87948-009Q (E850)	
IC160	8-752-894-26	IC CXP87948-011Q (E880)	
IC161	8-759-481-46	IC LB1943	
IC201	8-759-479-25	IC LA71514M-MPB	
IC202	8-759-439-50	IC LC89977M-TE-L	
IC360	8-759-486-63	IC TDA9615H/N1,518	
IC501	8-719-071-50	IC DIODE BZA408B-115 (F990)	
IC530	8-759-438-18	IC PQ12RD08	
IC540	8-759-438-16	IC STV6400D	
IC660	8-759-480-24	IC MB90089PF-G-212-BND-ER (E850/F900/F990)	
IC660	8-759-480-25	IC MB90089PF-G-215-BND-ER (E880)	
IC661	8-759-164-09	IC LA7218M	
IC820	8-759-700-07	IC NJM2903M	
IC850	8-759-484-61	IC SDA5650X-GEG	
		< JACK >	
J500	1-779-011-11	JACK, PIN 6P (AUDIO OUT)(F990)	
J500	1-784-414-11	JACK, PIN 2P (AUDIO OUT)(E850/F900)	
J500	1-784-412-11	JACK, PIN 3P (AUDIO OUT)(E880)	
J890	1-779-013-11	JACK, MINIATURE (SAT CONTROL)(E850/F990)	
		< JUMPER RESISTOR >	
JR001	1-216-296-91	SHORT 0	
JR002	1-216-295-91	SHORT 0	
JR003	1-216-295-91	SHORT 0	
JR004	1-216-295-91	SHORT 0	
JR005	1-216-296-91	SHORT 0	
JR006	1-216-296-91	SHORT 0	
JR007	1-216-296-91	SHORT 0	
JR008	1-216-296-91	SHORT 0	
JR009	1-216-295-91	SHORT 0	
JR010	1-216-295-91	SHORT 0	

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Ref. No.	Part No.	Description	Remarks
JR011	1-216-295-91	SHORT 0	
JR012	1-216-295-91	SHORT 0	
JR013	1-216-296-91	SHORT 0	
JR014	1-216-295-91	SHORT 0	
JR015	1-216-296-91	SHORT 0	
JR016	1-216-295-91	SHORT 0	
JR017	1-216-296-91	SHORT 0	
JR018	1-216-296-91	SHORT 0	
JR019	1-216-296-91	SHORT 0	
JR020	1-216-296-91	SHORT 0	
JR021	1-216-295-91	SHORT 0	
JR022	1-216-295-91	SHORT 0	
JR023	1-216-296-91	SHORT 0	
JR024	1-216-296-91	SHORT 0	
JR025	1-216-295-91	SHORT 0	
JR026	1-216-295-91	SHORT 0	
JR027	1-216-295-91	SHORT 0	
JR028	1-216-296-91	SHORT 0	
JR029	1-216-295-91	SHORT 0	
JR030	1-216-295-91	SHORT 0	
JR031	1-216-295-91	SHORT 0	
JR032	1-216-295-91	SHORT 0	
JR033	1-216-296-91	SHORT 0	
JR034	1-216-295-91	SHORT 0	
JR035	1-216-295-91	SHORT 0	
JR036	1-216-295-91	SHORT 0	
JR037	1-216-295-91	SHORT 0	
JR038	1-216-295-91	SHORT 0	
JR039	1-216-296-91	SHORT 0	
JR040	1-216-296-91	SHORT 0	
JR041	1-216-295-91	SHORT 0	
JR042	1-216-296-91	SHORT 0	
JR043	1-216-296-91	SHORT 0	
JR044	1-216-296-91	SHORT 0	
JR045	1-216-295-91	SHORT 0	
JR046	1-216-296-91	SHORT 0	
JR047	1-216-295-91	SHORT 0	
JR048	1-216-296-91	SHORT 0	
JR049	1-216-296-91	SHORT 0	
JR050	1-216-296-91	SHORT 0	
JR051	1-216-295-91	SHORT 0	
JR052	1-216-296-91	SHORT 0	
JR053	1-216-296-91	SHORT 0	
JR054	1-216-296-91	SHORT 0	
JR055	1-216-295-91	SHORT 0	
JR056	1-216-295-91	SHORT 0	
JR057	1-216-295-91	SHORT 0	
JR058	1-216-295-91	SHORT 0	
JR059	1-216-295-91	SHORT 0	
JR060	1-216-295-91	SHORT 0	
JS201	1-216-295-91	SHORT 0 (E850/F900:B/F990:B)	
JS390	1-216-296-91	SHORT 0 (E850/E880/F900)	
JS391	1-216-296-91	SHORT 0 (E850/E880/F900)	
JS392	1-216-295-91	SHORT 0 (F990)	
JS393	1-216-295-91	SHORT 0 (F990)	
JS542	1-216-295-91	SHORT 0 (E850:UX/F900:UX/F990:UX)	

Ref. No.	Part No.	Description	Remarks
		< COIL >	
L141	1-414-940-21	INDUCTOR 100uH	
L161	1-414-934-21	INDUCTOR 10uH	
L162	1-414-934-21	INDUCTOR 10uH	
L201	1-414-946-21	INDUCTOR 39uH	
L202	1-414-940-21	INDUCTOR 100uH	
L203	1-469-014-21	INDUCTOR 120uH	
L204	1-414-934-21	INDUCTOR 10uH	
L205	1-408-982-11	INDUCTOR 100uH	
L206	1-414-934-21	INDUCTOR 10uH	
L207	1-414-934-21	INDUCTOR 10uH	
L208	1-414-181-11	INDUCTOR 4.7uH (F900/F990)	
L301	1-414-940-21	INDUCTOR 100uH	
L361	1-414-940-21	INDUCTOR 100uH	
L510	1-414-940-21	INDUCTOR 100uH	
L530	1-414-940-21	INDUCTOR 100uH	
L540	1-414-934-21	INDUCTOR 10uH	
L660	1-414-186-31	INDUCTOR 33uH	
L662	1-414-940-21	INDUCTOR 100uH	
L663	1-414-940-21	INDUCTOR 100uH	
L664	1-412-470-21	INDUCTOR 22uH	
L701	1-414-930-21	INDUCTOR 2.2uH	
L750	1-414-930-21	INDUCTOR 2.2uH	
L755	1-414-940-21	INDUCTOR 100uH	
L890	1-408-970-21	INDUCTOR 10uH (E850/F990)	
		< PHOTO INTERUPTER >	
PH100	8-749-013-23	PHOTO INTERRUPTER GP3S120	
PH101	8-749-013-23	PHOTO INTERRUPTER GP3S120	
		< IC LINK >	
⚠PS130	1-533-586-31	LINK, IC 315mA	
⚠PS131	1-533-586-31	LINK, IC 315mA (E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)	
⚠PS533	1-533-586-31	LINK, IC 315mA	
		< TRANSISTOR >	
Q100	8-729-043-84	TRANSISTOR PT380F3	
Q101	8-729-043-84	TRANSISTOR PT380F3	
Q102	8-729-281-53	TRANSISTOR 2SC1815-GR	
Q141	8-729-424-08	TRANSISTOR UN2111	
Q201	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q202	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q208	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q209	8-729-216-22	TRANSISTOR 2SA1162-G	
Q210	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q211	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q301	8-729-281-53	TRANSISTOR 2SC1815-GR	
Q501	8-729-424-08	TRANSISTOR UN2111	
Q502	8-729-421-19	TRANSISTOR UN2213	
Q503	8-729-216-22	TRANSISTOR 2SA1162-G (E880/F990)	
Q510	8-729-216-22	TRANSISTOR 2SA1162-G	

Note :	**Note :**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remarks
Q533	8-729-804-41	TRANSISTOR 2SB1122-S			
Q534	8-729-421-19	TRANSISTOR UN2213			
Q540	8-729-216-22	TRANSISTOR 2SA1162-G			(E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
Q611	8-729-804-41	TRANSISTOR 2SB1122-S			(E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
Q612	8-729-421-19	TRANSISTOR UN2213			(E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
Q613	8-729-422-27	TRANSISTOR 2SD601A-Q			
Q660	8-729-421-19	TRANSISTOR UN2213			(E850:B/E880/F900:B/F990:B)
Q661	8-729-422-27	TRANSISTOR 2SD601A-Q			(E850:B/E880/F900:B/F990:B)
Q662	8-729-216-22	TRANSISTOR 2SA1162-G			
Q663	8-729-216-22	TRANSISTOR 2SA1162-G			
Q664	8-729-216-22	TRANSISTOR 2SA1162-G			
Q703	8-729-421-19	TRANSISTOR UN2213			
Q751	8-729-421-19	TRANSISTOR UN2213			
Q752	8-729-216-22	TRANSISTOR 2SA1162-G			
Q800	8-729-216-22	TRANSISTOR 2SA1162-G			
Q801	8-729-422-27	TRANSISTOR 2SD601A-Q			
Q802	8-729-422-27	TRANSISTOR 2SD601A-Q			
Q803	8-729-422-27	TRANSISTOR 2SD601A-Q			
Q804	8-729-421-19	TRANSISTOR UN2213			
Q820	8-729-422-27	TRANSISTOR 2SD601A-Q			
Q821	8-729-422-27	TRANSISTOR 2SD601A-Q			
Q850	8-729-216-22	TRANSISTOR 2SA1162-G			
Q891	8-729-422-27	TRANSISTOR 2SD601A-Q (E850/F990)			
Q892	8-729-140-75	TRANSISTOR 2SD999-CLCK (E850/F990)			
Q893	8-729-422-27	TRANSISTOR 2SD601A-Q (E850/F990)			
		< RESISTOR >			
R100	1-249-400-11	CARBON	39	5%	1/4W F
R101	1-249-400-11	CARBON	39	5%	1/4W F
R102	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R103	1-216-085-00	METAL CHIP	33K	5%	1/10W
R104	1-216-085-00	METAL CHIP	33K	5%	1/10W
R105	1-249-413-11	CARBON	470	5%	1/4W F
R106	1-216-089-91	RES,CHIP	47K	5%	1/10W
R107	1-216-089-91	RES,CHIP	47K	5%	1/10W
R109	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R110	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R111	1-216-103-00	METAL CHIP	180K	5%	1/10W
R112	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R113	1-208-806-11	RES,CHIP	10K	0.50%	1/10W
R114	1-208-806-11	RES,CHIP	10K	0.50%	1/10W
R115	1-216-089-91	RES,CHIP	47K	5%	1/10W
R116	1-216-089-91	RES,CHIP	47K	5%	1/10W
R117	1-216-089-91	RES,CHIP	47K	5%	1/10W
R118	1-216-089-91	RES,CHIP	47K	5%	1/10W
R130	1-216-085-00	METAL CHIP	33K	5%	1/10W
R131	1-216-085-00	METAL CHIP	33K	5%	1/10W
R132	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R133	1-216-073-00	METAL CHIP	10K	5%	1/10W
R134	1-216-089-91	RES,CHIP	47K	5%	1/10W
R145	1-216-105-91	RES,CHIP	220K	5%	1/10W
R146	1-249-429-11	CARBON	10K	5%	1/4W
R147	1-208-830-11	RES,CHIP	100K	0.50%	1/10W
R148	1-208-830-11	RES,CHIP	100K	0.50%	1/10W
R149	1-208-830-11	RES,CHIP	100K	0.50%	1/10W
R151	1-208-830-11	RES,CHIP	100K	0.50%	1/10W
R152	1-216-111-00	METAL CHIP	390K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R153	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R155	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R160	1-216-073-00	METAL CHIP	10K	5%	1/10W
R161	1-216-073-00	METAL CHIP	10K	5%	1/10W
R162	1-216-089-91	RES,CHIP	47K	5%	1/10W
R163	1-249-429-11	CARBON	10K	5%	1/4W
R164	1-249-437-11	CARBON	47K	5%	1/4W
R165	1-216-041-00	METAL CHIP	470	5%	1/10W
R166	1-216-041-00	METAL CHIP	470	5%	1/10W
R167	1-249-417-11	CARBON	1K	5%	1/4W F
R168	1-247-807-31	CARBON	100	5%	1/4W
R169	1-247-807-31	CARBON	100	5%	1/4W
R170	1-247-807-31	CARBON	100	5%	1/4W
R171	1-247-807-31	CARBON	100	5%	1/4W
R172	1-249-429-11	CARBON	10K	5%	1/4W
R173	1-249-429-11	CARBON	10K	5%	1/4W
R174	1-216-041-00	METAL CHIP	470	5%	1/10W
R175	1-216-049-91	RES,CHIP	1K	5%	1/10W
R176	1-249-429-11	CARBON	10K	5%	1/4W
R177	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R178	1-216-295-91	SHORT	0		
R179	1-249-429-11	CARBON	10K	5%	1/4W
R180	1-216-089-91	RES,CHIP	47K	5%	1/10W
R181	1-216-097-91	RES,CHIP	100K	5%	1/10W
R183	1-249-413-11	CARBON	470	5%	1/4W F
R184	1-249-413-11	CARBON	470	5%	1/4W F
R201	1-216-041-00	METAL CHIP	470	5%	1/10W
R202	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R203	1-249-413-11	CARBON	470	5%	1/4W F
R204	1-216-047-91	RES,CHIP	820	5%	1/10W
R205	1-216-037-00	METAL CHIP	330	5%	1/10W
R206	1-216-037-00	METAL CHIP	330	5%	1/10W
R207	1-216-073-00	METAL CHIP	10K	5%	1/10W
R208	1-216-055-00	METAL CHIP	1.8K	5%	1/10W (E850:B/F900:B/F990:B)
R208	1-216-059-00	METAL CHIP	2.7K	5%	1/10W (E850:UK/E880/F900:VC,NP,UX/F990:VC,NP,UX)
R209	1-216-041-00	METAL CHIP	470	5%	1/10W
R210	1-216-025-91	RES,CHIP	100	5%	1/10W
R218	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R219	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R221	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R222	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R223	1-216-017-91	RES,CHIP	47	5%	1/10W
R224	1-216-017-91	RES,CHIP	47	5%	1/10W
R225	1-216-017-91	RES,CHIP	47	5%	1/10W
R226	1-216-025-91	RES,CHIP	100	5%	1/10W
R227	1-216-025-91	RES,CHIP	100	5%	1/10W
R228	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R229	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R230	1-216-045-00	METAL CHIP	680	5%	1/10W
R231	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R232	1-216-049-91	RES,CHIP	1K	5%	1/10W
R233	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R234	1-216-089-91	RES,CHIP	47K	5%	1/10W
R235	1-216-049-91	RES,CHIP	1K	5%	1/10W
R236	1-216-049-91	RES,CHIP	1K	5%	1/10W
R239	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R240	1-216-049-91	RES,CHIP	1K	5%	1/10W
R243	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R248	1-216-295-91	SHORT	0		

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Ref. No.	Part No.	Description			Remarks
R250	1-216-065-91	RES,CHIP	4.7K	5%	1/10W (E850:UX/F900:VC,NP,UX/F990:VC,NP,UX)
R251	1-249-413-11	CARBON	470	5%	1/4W F (F900/F990)
R301	1-249-439-11	CARBON	68K	5%	1/4W
R302	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R306	1-216-073-00	METAL CHIP	10K	5%	1/10W
R307	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R309	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R310	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R311	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R312	1-216-079-00	METAL CHIP	18K	5%	1/10W
R313	1-216-109-00	METAL CHIP	330K	5%	1/10W
R314	1-216-035-00	METAL CHIP	270	5%	1/10W
R315	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R316	1-216-073-00	METAL CHIP	10K	5%	1/10W
R318	1-216-075-00	METAL CHIP	12K	5%	1/10W
R320	1-216-047-91	RES,CHIP	820	5%	1/10W
R360	1-216-081-00	METAL CHIP	22K	5%	1/10W
R361	1-216-081-00	METAL CHIP	22K	5%	1/10W
R368	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R370	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R371	1-208-820-11	RES,CHIP	39K	0.50%	1/10W
R372	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R378	1-216-083-00	METAL CHIP	27K	5%	1/10W
R380	1-216-295-91	SHORT	0		
R381	1-216-295-91	SHORT	0		
R382	1-216-079-00	METAL CHIP	18K	5%	1/10W
R383	1-216-079-00	METAL CHIP	18K	5%	1/10W
R384	1-216-091-00	METAL CHIP	56K	5%	1/10W
R385	1-216-091-00	METAL CHIP	56K	5%	1/10W
R389	1-216-073-00	METAL CHIP	10K	5%	1/10W
R390	1-216-079-00	METAL CHIP	18K	5%	1/10W (E850:B/E880/F900:VC,NP,B/F990)
R391	1-216-079-00	METAL CHIP	18K	5%	1/10W (E850:B/E880/F900:VC,NP,B/F990)
R392	1-216-295-91	SHORT	0 (F990)		
R392	1-216-079-00	METAL CHIP	18K	5%	1/10W (E850/E880/F900)
R393	1-216-295-91	SHORT	0 (F990)		
R393	1-216-079-00	METAL CHIP	18K	5%	1/10W (E850/E880/F900)
R394	1-216-049-91	RES,CHIP	1K	5%	1/10W
R399	1-216-049-91	RES,CHIP	1K	5%	1/10W
R500	1-216-041-00	METAL CHIP	470	5%	1/10W
R501	1-216-041-00	METAL CHIP	470	5%	1/10W
R502	1-216-025-91	RES,CHIP	100	5%	1/10W
R503	1-216-025-91	RES,CHIP	100	5%	1/10W
R504	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R505	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R506	1-216-041-00	METAL CHIP	470	5%	1/10W (F990)
R507	1-216-041-00	METAL CHIP	470	5%	1/10W (F990)
R508	1-216-025-91	RES,CHIP	100	5%	1/10W (E850/E880/F990)
R509	1-249-411-11	CARBON	330	5%	1/4W (E850/E880/F990)
R510	1-249-408-11	CARBON	180	5%	1/4W F
R511	1-249-407-11	CARBON	150	5%	1/4W F
R512	1-216-022-00	METAL CHIP	75	5%	1/10W
R514	1-216-037-00	METAL CHIP	330	5%	1/10W
R515	1-216-049-91	RES,CHIP	1K	5%	1/10W
R516	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R517	1-216-022-00	METAL CHIP	75	5%	1/10W
R518	1-216-022-00	METAL CHIP	75	5%	1/10W (E850/E880/F990)
R519	1-216-022-00	METAL CHIP	75	5%	1/10W (F990)
R533	1-216-049-91	RES,CHIP	1K	5%	1/10W
R534	1-216-049-91	RES,CHIP	1K	5%	1/10W
R540	1-216-025-91	RES,CHIP	100	5%	1/10W (E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
R541	1-216-053-00	METAL CHIP	1.5K	5%	1/10W (E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
R542	1-216-053-00	METAL CHIP	1.5K	5%	1/10W (E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
R545	1-216-085-00	METAL CHIP	33K	5%	1/10W
R546	1-216-089-91	RES,CHIP	47K	5%	1/10W
R547	1-216-049-91	RES,CHIP	1K	5%	1/10W (E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
R548	1-216-022-00	METAL CHIP	75	5%	1/10W
R549	1-247-804-11	CARBON	75	5%	1/4W (E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
R570	1-249-413-11	CARBON	470	5%	1/4W F
R571	1-249-413-11	CARBON	470	5%	1/4W F
R572	1-216-025-91	RES,CHIP	100	5%	1/10W (E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
R573	1-216-025-91	RES,CHIP	100	5%	1/10W (E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
R574	1-216-097-91	RES,CHIP	100K	5%	1/10W (E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
R575	1-216-097-91	RES,CHIP	100K	5%	1/10W (E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
R620	1-216-049-91	RES,CHIP	1K	5%	1/10W (E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
R621	1-216-049-91	RES,CHIP	1K	5%	1/10W (E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
R622	1-216-073-00	METAL CHIP	10K	5%	1/10W
R623	1-249-429-11	CARBON	10K	5%	1/4W
R624	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R660	1-216-073-00	METAL CHIP	10K	5%	1/10W (E850:B/E880/F900:B/F990:B)
R661	1-216-073-00	METAL CHIP	10K	5%	1/10W (E850:B/E880/F900:B/F990:B)
R662	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R663	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R664	1-216-081-00	METAL CHIP	22K	5%	1/10W
R665	1-216-049-91	RES,CHIP	1K	5%	1/10W (E850:UX/F900:UX/F990:UX)
R665	1-216-041-00	METAL CHIP	470	5%	1/10W (E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
R666	1-216-295-91	SHORT	0		(E850:UX/F900:UX/F990:UX)
R666	1-216-041-00	METAL CHIP	470	5%	1/10W (E850:B/E880/F900:VC,NP,B/F990:VC,NP,B)
R667	1-216-081-00	METAL CHIP	22K	5%	1/10W
R668	1-216-073-00	METAL CHIP	10K	5%	1/10W
R669	1-216-033-00	METAL CHIP	220	5%	1/10W
R670	1-216-041-00	METAL CHIP	470	5%	1/10W
R671	1-249-407-11	CARBON	150	5%	1/4W F
R672	1-216-073-00	METAL CHIP	10K	5%	1/10W
R673	1-216-073-00	METAL CHIP	10K	5%	1/10W
R674	1-216-073-00	METAL CHIP	10K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R675	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R676	1-216-043-91	RES,CHIP	560	5%	1/10W
R677	1-216-101-00	METAL CHIP	150K	5%	1/10W
R678	1-216-049-91	RES,CHIP	1K	5%	1/10W
R702	1-216-295-91	SHORT	0		
R709	1-216-105-91	RES,CHIP	220K	5%	1/10W (E850:B/F900:B/F990:B)
R709	1-216-081-00	METAL CHIP	22K	5%	1/10W (E850/E880/F900:VC,NP,UX/F990:VC,NP,UX)
R711	1-212-893-00	FUSIBLE	330	5%	1/4W F
R713	1-216-025-91	RES,CHIP	100	5%	1/10W
R714	1-216-113-00	METAL CHIP	470K	5%	1/10W
R715	1-216-049-91	RES,CHIP	1K	5%	1/10W
R716	1-216-049-91	RES,CHIP	1K	5%	1/10W
R717	1-216-037-00	METAL CHIP	330	5%	1/10W
R730	1-216-041-00	METAL CHIP	470	5%	1/10W
R731	1-216-041-00	METAL CHIP	470	5%	1/10W (E850:B/F900:B/F990:B)
R732	1-216-041-00	METAL CHIP	470	5%	1/10W
R733	1-216-041-00	METAL CHIP	470	5%	1/10W (E850:B/E880/F900:B/F990:B)
R754	1-216-025-91	RES,CHIP	100	5%	1/10W
R755	1-216-025-91	RES,CHIP	100	5%	1/10W
R756	1-216-073-00	METAL CHIP	10K	5%	1/10W
R757	1-216-049-91	RES,CHIP	1K	5%	1/10W
R800	1-216-101-00	METAL CHIP	150K	5%	1/10W
R801	1-216-073-00	METAL CHIP	10K	5%	1/10W
R802	1-216-073-00	METAL CHIP	10K	5%	1/10W
R803	1-216-081-00	METAL CHIP	22K	5%	1/10W
R804	1-216-073-00	METAL CHIP	10K	5%	1/10W
R805	1-216-073-00	METAL CHIP	10K	5%	1/10W
R806	1-216-073-00	METAL CHIP	10K	5%	1/10W
R807	1-216-085-00	METAL CHIP	33K	5%	1/10W
R813	1-216-073-00	METAL CHIP	10K	5%	1/10W
R814	1-216-089-91	RES,CHIP	47K	5%	1/10W
R820	1-216-073-00	METAL CHIP	10K	5%	1/10W
R821	1-216-073-00	METAL CHIP	10K	5%	1/10W
R823	1-216-081-00	METAL CHIP	22K	5%	1/10W
R825	1-216-081-00	METAL CHIP	22K	5%	1/10W
R826	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R827	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R828	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R829	1-216-081-00	METAL CHIP	22K	5%	1/10W
R830	1-216-081-00	METAL CHIP	22K	5%	1/10W
R831	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R832	1-216-037-00	METAL CHIP	330	5%	1/10W
R833	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R834	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R850	1-247-807-31	CARBON	100	5%	1/4W
R851	1-216-079-00	METAL CHIP	18K	5%	1/10W
R852	1-216-083-00	METAL CHIP	27K	5%	1/10W
R853	1-216-049-91	RES,CHIP	1K	5%	1/10W
R856	1-216-097-91	RES,CHIP	100K	5%	1/10W
R857	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R858	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R859	1-216-123-11	METAL CHIP	1.2M	5%	1/10W
R860	1-216-123-11	METAL CHIP	1.2M	5%	1/10W
R861	1-216-117-00	METAL CHIP	680K	5%	1/10W
R862	1-216-057-00	METAL CHIP	2.2K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R890	1-216-065-91	RES,CHIP	4.7K	5%	1/10W (E850/F990)
R891	1-216-105-91	RES,CHIP	220K	5%	1/10W (E850/F990)
R892	1-216-057-00	METAL CHIP	2.2K	5%	1/10W (E850/F990)
R893	1-216-049-91	RES,CHIP	1K	5%	1/10W (E850/F990)
R894	1-216-037-00	METAL CHIP	330	5%	1/10W (E850/F990)
R896	1-216-308-00	METAL CHIP	4.7	5%	1/10W (E850/F990)
		< MODULATOR >			
RFU750	1-475-058-11	MODULATOR, RF (RFU-2110) (E850:B/F900:B/F990:B)			
RFU750	1-475-059-11	MODULATOR, RF (RFU-2101) (E850:UK/E880/F900:VC,NP,UX/F990:VC,NP,UX)			
		< SWITCH >			
S100	1-771-155-11	SWITCH, ROTARY (ROTARY ENCODER)			
S101	1-762-108-11	SWITCH, PUSH (1 KEY) (CASSETTE IN/REC PROOF)			
S160	1-571-588-31	SWITCH, SLIDE (NTSC PB)			
		< TUNER >			
TU701	8-598-402-00	FSS TUNER BTF-WC411 (F900:NP/F990:NP)			
TU701	8-598-403-00	FSS TUNER BTF-WU601 (E850:UX/F900:UX/F990:UX)			
TU702	1-693-362-11	TUNER, (IF) SOLID TYPE (E850:B/F900:B/F990:B)			
TU702	1-693-368-11	TUNER, (IF) SOLID TYPE (F900:VC/F990:VC)			
TU702	1-693-361-11	TUNER, (IF) SOLID TYPE (E880)			
		< VIBRATOR >			
X160	1-760-494-11	VIBRATOR, CRYSTAL 16MHz			
X201	1-579-608-11	VIBRATOR, CRYSTAL 4.433619MHz			
X660	1-577-289-11	VIBRATOR, CRYSTAL 17.734475MHz			
X661	1-577-165-11	VIBLATOR, CERAMIC 500kHz			
*	A-6791-618-A	ML-15 BOARD, COMPLETE (F900/F990) ********************** (Ref.No.:6,000 series)			
		< CAPACITOR >			
C902	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C903	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C904	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C906	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C907	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C908	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C909	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C910	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C911	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C912	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C913	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C914	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C915	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C916	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C917	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V

Ref. No.	Part No.	Description			Remarks
C919	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C920	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C921	1-128-131-11	ELECT	22uF	20%	50V
C923	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C924	1-124-589-11	ELECT	47uF	20%	16V
C925	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C928	1-128-131-11	ELECT	22uF	20%	50V
C929	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C930	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C931	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C932	1-128-057-11	ELECT	330uF	20%	6.3V
C933	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C934	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C935	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C938	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C939	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C940	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C941	1-128-131-11	ELECT	22uF	20%	50V
C942	1-128-131-11	ELECT	22uF	20%	50V
C943	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C950	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C951	1-124-584-00	ELECT	100uF	20%	10V
C952	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V
C953	1-110-501-11	CERAMIC CHIP	0.33uF	10%	16V
C954	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C955	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C956	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C960	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C961	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C962	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V
C963	1-124-584-00	ELECT	100uF	20%	10V
C964	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V
C980	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C981	1-124-589-11	ELECT	47uF	20%	16V
		< CONNECTOR >			
* CN900	1-568-941-11	PIN, CONNECTOR 3P			
* CN901	1-568-941-11	PIN, CONNECTOR 3P			
* CN950	1-750-422-11	CONNECTOR, FFC/FPC 17P			
		< DIODE >			
D900	8-719-911-19	DIODE	1SS119		
D901	8-719-911-19	DIODE	1SS119		
D902	8-719-911-19	DIODE	1SS119		
D903	8-719-911-19	DIODE	1SS119		
D904	8-719-200-82	DIODE	11ES2		
D905	8-719-911-19	DIODE	1SS119		
		< FERRITE BEAD >			
FB900	1-414-233-21	INDUCTOR CHIP	0UH		
FB901	1-414-233-21	INDUCTOR CHIP	0UH		
FB902	1-414-233-21	INDUCTOR CHIP	0UH		
FB903	1-414-233-21	INDUCTOR CHIP	0UH		
FB904	1-414-234-11	INDUCTOR CHIP	0UH		
FB905	1-414-234-11	INDUCTOR CHIP	0UH		
FB906	1-414-234-11	INDUCTOR CHIP	0UH		
FB907	1-414-234-11	INDUCTOR CHIP	0UH		
FB908	1-414-233-21	INDUCTOR CHIP	0UH		
FB909	1-414-235-11	INDUCTOR CHIP	0UH		
FB910	1-414-235-11	INDUCTOR CHIP	0UH		
FB911	1-414-235-11	INDUCTOR CHIP	0UH		
FB912	1-414-235-11	INDUCTOR CHIP	0UH		
FB920	1-414-233-21	INDUCTOR CHIP	0UH		
FB921	1-414-233-21	INDUCTOR CHIP	0UH		
FB950	1-414-233-21	INDUCTOR CHIP	0UH		
FB951	1-414-233-21	INDUCTOR CHIP	0UH		
FB952	1-414-233-21	INDUCTOR CHIP	0UH		
		< IC >			
IC900	8-759-100-93	IC	UPC393G2		
IC901	8-759-531-73	IC	CXD8753Q		
IC902	8-752-894-25	IC	CXP84632-021Q		
IC950	8-759-376-75	IC	SDA5250M-C5-GEG		
		< JUMPER RESISTOR >			
JR001	1-216-296-91	SHORT	0		
JR002	1-216-296-91	SHORT	0		
JR003	1-216-296-91	SHORT	0		
JR004	1-216-296-91	SHORT	0		
JR005	1-216-296-91	SHORT	0		
JR006	1-216-296-91	SHORT	0		
JR007	1-216-296-91	SHORT	0		
JR008	1-216-296-91	SHORT	0		
JR009	1-216-296-91	SHORT	0		
JR011	1-216-296-91	SHORT	0		
JR012	1-216-296-91	SHORT	0		
JR021	1-216-296-91	SHORT	0		
JR022	1-216-295-91	SHORT	0		
JR023	1-216-295-91	SHORT	0		
JR024	1-216-295-91	SHORT	0		
JR025	1-216-295-91	SHORT	0		
JR029	1-216-295-91	SHORT	0		
JR034	1-216-296-91	SHORT	0		
JS954	1-216-295-91	SHORT	0		
		< COIL >			
L900	1-414-934-21	INDUCTOR	10uH		
L901	1-414-934-21	INDUCTOR	10uH		
L902	1-414-934-21	INDUCTOR	10uH		
L903	1-414-934-21	INDUCTOR	10uH		
L904	1-414-940-21	INDUCTOR	100uH		
L905	1-414-936-21	INDUCTOR	22uH		
L906	1-414-936-21	INDUCTOR	22uH		
L907	1-414-936-21	INDUCTOR	22uH		
L912	1-414-936-21	INDUCTOR	22uH		
L950	1-414-934-21	INDUCTOR	10uH		
		< IC LINK >			
⚠PS901	1-533-587-21	LINK, IC 400mA			
⚠PS950	1-533-901-11	LINK, IC 125mA			
		< TRANSISTOR >			
Q900	8-729-216-22	TRANSISTOR	2SA1162-G		
Q901	8-729-044-60	TRANSISTOR	2SC3383-T-AA		
Q902	8-729-044-60	TRANSISTOR	2SC3383-T-AA		
Q903	8-729-421-19	TRANSISTOR	UN2213		
Q904	8-729-422-27	TRANSISTOR	2SD601A-Q		

Note :	**Note :**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remarks
Q905	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q906	8-729-216-22	TRANSISTOR 2SA1162-G	
Q907	8-729-216-22	TRANSISTOR 2SA1162-G	
Q908	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q909	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q910	8-729-421-19	TRANSISTOR UN2213	
Q911	8-729-044-60	TRANSISTOR 2SC3383-T-AA	
Q912	8-729-421-19	TRANSISTOR UN2213	
Q913	8-729-044-60	TRANSISTOR 2SC3383-T-AA	
Q914	8-729-421-19	TRANSISTOR UN2213	
Q915	8-729-216-22	TRANSISTOR 2SA1162-G	
Q916	8-729-804-41	TRANSISTOR 2SB1122-S	
Q917	8-729-421-19	TRANSISTOR UN2213	
		< RESISTOR >	
R800	1-216-295-91	SHORT 0	
R801	1-216-295-91	SHORT 0	
R802	1-216-295-91	SHORT 0	
R803	1-216-295-91	SHORT 0	
R804	1-216-295-91	SHORT 0	
R805	1-216-295-91	SHORT 0	
R806	1-216-295-91	SHORT 0	
R807	1-216-295-91	SHORT 0	
R808	1-216-295-91	SHORT 0	
R809	1-216-295-91	SHORT 0	
R810	1-216-295-91	SHORT 0	
R811	1-216-295-91	SHORT 0	
R812	1-216-295-91	SHORT 0	
R813	1-216-295-91	SHORT 0	
R814	1-216-295-91	SHORT 0	
R815	1-216-295-91	SHORT 0	
R816	1-216-295-91	SHORT 0	
R817	1-216-295-91	SHORT 0	
R818	1-216-295-91	SHORT 0	
R819	1-216-295-91	SHORT 0	
R820	1-216-295-91	SHORT 0	
R821	1-216-295-91	SHORT 0	
R822	1-216-295-91	SHORT 0	
R823	1-216-295-91	SHORT 0	
R824	1-216-295-91	SHORT 0	
R825	1-216-295-91	SHORT 0	
R900	1-216-045-00	METAL CHIP 680 5%	1/10W
R902	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R903	1-216-025-91	RES,CHIP 100 5%	1/10W
R905	1-216-049-91	RES,CHIP 1K 5%	1/10W
R907	1-249-402-11	CARBON 56 5%	1/4W F
R908	1-216-049-91	RES,CHIP 1K 5%	1/10W
R909	1-216-049-91	RES,CHIP 1K 5%	1/10W
R910	1-249-398-11	CARBON 27 5%	1/4W F
R911	1-216-065-91	RES,CHIP 4.7K 5%	1/10W
R912	1-216-049-91	RES,CHIP 1K 5%	1/10W
R914	1-216-295-91	SHORT 0	
R915	1-216-065-91	RES,CHIP 4.7K 5%	1/10W
R916	1-216-025-91	RES,CHIP 100 5%	1/10W
R918	1-216-065-91	RES,CHIP 4.7K 5%	1/10W
R919	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R921	1-216-065-91	RES,CHIP 4.7K 5%	1/10W
R922	1-216-045-00	METAL CHIP 680 5%	1/10W
R923	1-216-025-91	RES,CHIP 100 5%	1/10W
R924	1-216-057-00	METAL CHIP 2.2K 5%	1/10W

Ref. No.	Part No.	Description	Remarks
R925	1-216-045-00	METAL CHIP 680 5%	1/10W
R927	1-216-089-91	RES,CHIP 47K 5%	1/10W
R928	1-216-081-00	METAL CHIP 22K 5%	1/10W
R929	1-216-025-91	RES,CHIP 100 5%	1/10W
R930	1-216-089-91	RES,CHIP 47K 5%	1/10W
R931	1-216-081-00	METAL CHIP 22K 5%	1/10W
R932	1-216-025-91	RES,CHIP 100 5%	1/10W
R933	1-216-049-91	RES,CHIP 1K 5%	1/10W
R934	1-216-017-91	RES,CHIP 47 5%	1/10W
R935	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R936	1-216-049-91	RES,CHIP 1K 5%	1/10W
R938	1-216-017-91	RES,CHIP 47 5%	1/10W
R939	1-249-402-11	CARBON 56 5%	1/4W F
R941	1-249-398-11	CARBON 27 5%	1/4W F
R942	1-216-065-91	RES,CHIP 4.7K 5%	1/10W
R943	1-216-063-91	RES,CHIP 3.9K 5%	1/10W
R944	1-216-065-91	RES,CHIP 4.7K 5%	1/10W
R946	1-216-295-91	SHORT 0	
R947	1-216-063-91	RES,CHIP 3.9K 5%	1/10W
R948	1-216-065-91	RES,CHIP 4.7K 5%	1/10W
R949	1-216-025-91	RES,CHIP 100 5%	1/10W
R951	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R952	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R953	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R954	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
R955	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
R956	1-216-095-00	METAL CHIP 82K 5%	1/10W
R957	1-216-121-91	RES,CHIP 1M 5%	1/10W
R958	1-216-295-91	SHORT 0	
R959	1-216-295-91	SHORT 0	
R962	1-216-295-91	SHORT 0	
R967	1-216-295-91	SHORT 0	
R969	1-216-045-00	METAL CHIP 680 5%	1/10W
R970	1-216-121-91	RES,CHIP 1M 5%	1/10W
R972	1-216-049-91	RES,CHIP 1K 5%	1/10W
R973	1-216-049-91	RES,CHIP 1K 5%	1/10W
R974	1-216-295-91	SHORT 0	
R975	1-216-295-91	SHORT 0	
R976	1-216-295-91	SHORT 0	
R977	1-216-089-91	RES,CHIP 47K 5%	1/10W
R978	1-216-089-91	RES,CHIP 47K 5%	1/10W
R979	1-216-043-91	RES,CHIP 560 5%	1/10W
R981	1-216-295-91	SHORT 0	
R983	1-216-295-91	SHORT 0	
R984	1-216-295-91	SHORT 0	
R985	1-216-295-91	SHORT 0	
R986	1-216-041-00	METAL CHIP 470 5%	1/10W
R987	1-216-041-00	METAL CHIP 470 5%	1/10W
R988	1-216-041-00	METAL CHIP 470 5%	1/10W
R989	1-216-041-00	METAL CHIP 470 5%	1/10W
R990	1-216-295-91	SHORT 0	
R993	1-216-073-00	METAL CHIP 10K 5%	1/10W
		< VIBRATOR >	
X900	1-767-914-21	VIBRATOR, CRYSTAL 13.56MHz	
X902	1-579-463-11	VIBRATOR, CRYSTAL 32.768kHz	

NR-26

Ref. No.	Part No.	Description			Remarks
*	A-6791-605-A	NR-26 BOARD, COMPLETE			
		**********************			
		(E880/F900:VC,NP,UX/F990:VC,NP,UX)			
		(Ref.No.:6,000 series)			
		< CAPACITOR >			
C001	1-164-346-11	CERAMIC CHIP	1uF		16V
C002	1-124-584-00	ELECT	100uF	20%	10V
C004	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C005	1-124-465-00	ELECT	0.47uF	20%	50V
C006	1-124-465-00	ELECT	0.47uF	20%	50V
C007	1-126-157-11	ELECT	10uF	20%	16V
C008	1-124-584-00	ELECT	100uF	20%	10V
C009	1-126-157-11	ELECT	10uF	20%	16V
C010	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C011	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C012	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C013	1-124-584-00	ELECT	100uF	20%	10V
C014	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C015	1-164-346-11	CERAMIC CHIP	1uF		16V
C016	1-124-465-00	ELECT	0.47uF	20%	50V
C017	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C018	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C019	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C020	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C021	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C022	1-126-157-11	ELECT	10uF	20%	16V
C023	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C024	1-124-257-00	ELECT	2.2uF	20%	50V
C025	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C026	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C027	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C028	1-126-154-11	ELECT	47uF	20%	6.3V
C029	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C030	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C031	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C032	1-126-154-11	ELECT	47uF	20%	6.3V
C033	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C034	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C036	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C037	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C038	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C039	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C040	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C041	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C042	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C045	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C046	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C047	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C048	1-163-031-11	CERAMIC CHIP	0.01uF		50V
		< CONNECTOR >			
CN001	1-573-825-11	CONNECTOR, BOARD TO BOARD 11P			
		< FILTER >			
FL001	1-234-083-11	FILTER, LOW PASS			
FL002	1-234-084-11	FILTER, BAND PASS			

Ref. No.	Part No.	Description			Remarks
		< IC >			
IC001	8-759-431-14	IC PQ3TZ53U			
IC002	8-759-324-99	IC MM1118XFBE			
IC003	8-759-493-00	IC LC74391E			
		< COIL >			
L001	1-414-934-21	INDUCTOR	10uH		
L002	1-414-934-21	INDUCTOR	10uH		
L003	1-414-934-21	INDUCTOR	10uH		
L004	1-414-936-21	INDUCTOR	22uH		
		< TRANSISTOR >			
Q001	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q002	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q003	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q004	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q005	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q006	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q007	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q008	8-729-216-22	TRANSISTOR	2SA1162-G		
Q009	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q010	8-729-216-22	TRANSISTOR	2SA1162-G		
Q011	8-729-216-22	TRANSISTOR	2SA1162-G		
Q012	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q013	8-729-422-27	TRANSISTOR	2SD601A-Q		
		< RESISTOR >			
R001	1-216-049-91	RES,CHIP	1K	5%	1/10W
R002	1-216-045-00	METAL CHIP	680	5%	1/10W
R003	1-216-049-91	RES,CHIP	1K	5%	1/10W
R004	1-216-049-91	RES,CHIP	1K	5%	1/10W
R005	1-216-081-00	METAL CHIP	22K	5%	1/10W
R006	1-216-073-00	METAL CHIP	10K	5%	1/10W
R007	1-216-049-91	RES,CHIP	1K	5%	1/10W
R008	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R009	1-216-049-91	RES,CHIP	1K	5%	1/10W
R010	1-216-045-00	METAL CHIP	680	5%	1/10W
R011	1-216-081-00	METAL CHIP	22K	5%	1/10W
R012	1-216-073-00	METAL CHIP	10K	5%	1/10W
R013	1-216-045-00	METAL CHIP	680	5%	1/10W
R014	1-216-050-00	RES,CHIP	1.1K	5%	1/10W
R015	1-216-049-91	RES,CHIP	1K	5%	1/10W
R016	1-216-049-91	RES,CHIP	1K	5%	1/10W
R017	1-216-049-91	RES,CHIP	1K	5%	1/10W
R018	1-216-049-91	RES,CHIP	1K	5%	1/10W
R019	1-216-081-00	METAL CHIP	22K	5%	1/10W
R020	1-216-073-00	METAL CHIP	10K	5%	1/10W
R021	1-216-049-91	RES,CHIP	1K	5%	1/10W
R022	1-216-049-91	RES,CHIP	1K	5%	1/10W
R023	1-216-044-00	METAL CHIP	620	5%	1/10W
R024	1-216-025-91	RES,CHIP	100	5%	1/10W
R025	1-216-049-91	RES,CHIP	1K	5%	1/10W
R027	1-216-049-91	RES,CHIP	1K	5%	1/10W
R028	1-216-049-91	RES,CHIP	1K	5%	1/10W
R029	1-216-049-91	RES,CHIP	1K	5%	1/10W
R030	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R031	1-216-057-00	METAL CHIP	2.2K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R032	1-216-049-91	RES,CHIP	1K	5%	1/10W
R033	1-216-041-00	METAL CHIP	470	5%	1/10W
R034	1-216-025-91	RES,CHIP	100	5%	1/10W
R035	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R036	1-216-121-91	RES,CHIP	1M	5%	1/10W
R037	1-216-052-00	METAL CHIP	1.3K	5%	1/10W
R038	1-216-078-00	RES,CHIP	16K	5%	1/10W
R039	1-216-073-00	METAL CHIP	10K	5%	1/10W
R040	1-216-073-00	METAL CHIP	10K	5%	1/10W
R041	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R042	1-216-081-00	METAL CHIP	22K	5%	1/10W
R043	1-216-049-91	RES,CHIP	1K	5%	1/10W
R044	1-216-049-91	RES,CHIP	1K	5%	1/10W
R045	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R046	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R047	1-216-073-00	METAL CHIP	10K	5%	1/10W
R048	1-216-049-91	RES,CHIP	1K	5%	1/10W

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description
RV001	1-241-763-11	RES, ADJ, CERMET 4.7K
RV002	1-241-763-11	RES, ADJ, CERMET 4.7K

Ref. No.	Part No.	Description
*	A-6791-531-A	RP-231B BOARD, COMPLETE ************************ (E850/E880/F990)
*	A-6791-617-A	RP-231B BOARD, COMPLETE (F900) ************************ (Ref.No.:1,000 series)

< CAPACITOR >

Ref. No.	Part No.	Description			Remarks
C141	1-163-263-11	CERAMIC CHIP	330PF	5%	50V
C142	1-126-960-11	ELECT	1uF	20%	50V
C143	1-104-664-11	ELECT	47uF	20%	16V
C144	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C145	1-163-018-00	CERAMIC CHIP	0.0056uF	5%	50V
C146	1-126-933-11	ELECT	100uF	20%	16V
C147	1-126-960-11	ELECT	1uF	20%	50V
C260	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C261	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C264	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C265	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C266	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C267	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C268	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C269	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C270	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C271	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C272	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C273	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C274	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C275	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C276	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C277	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C278	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C279	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C280	1-124-584-00	ELECT	100uF	20%	10V
C282	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C283	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C284	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C285	1-109-982-11	CERAMIC CHIP	1uF	10%	10V

Ref. No.	Part No.	Description			Remarks
C286	1-128-057-11	ELECT	330uF	20%	6.3V
C287	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C288	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C289	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C298	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C321	1-104-664-11	ELECT	47uF	20%	16V
C322	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C323	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C324	1-104-697-11	FILM	0.047uF	5%	100V (F900)
C324	1-137-462-11	FILM	0.018uF	5%	100V (E850/E880/F990)
C331	1-126-933-11	ELECT	100uF	20%	16V (E850/E880/F990)
C332	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V (E850/E880//F990)
C334	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V (E850/E880/F990)
C335	1-137-397-11	FILM	0.047uF	5%	100V (E850/E880/F990)
C340	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C341	1-124-584-00	ELECT	100uF	20%	10V
C342	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C346	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C350	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C352	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C353	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C357	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C358	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C359	1-163-031-11	CERAMIC CHIP	0.01uF		50V

< CONNECTOR >

Ref. No.	Part No.	Description
CN260	1-784-492-11	CONNECTOR, FFC/FPC 13P
* CN261	1-564-030-00	PIN, CONNECTOR 5P
CN271	1-573-829-11	CONNECTOR, BOARD TO BOARD 15P
CN272	1-766-720-11	CONNECTOR, BOARD TO BOARD 17P
CN301	1-506-481-11	PIN, CONNECTOR 2P
* CN302	1-568-944-11	PIN, CONNECTOR 6P
* CN341	1-564-027-00	PIN, CONNECTOR 2P

< IC >

Ref. No.	Part No.	Description
IC140	8-759-438-83	IC BA6305F-E2
IC260	8-759-352-17	IC HA118195NT
IC301	8-759-499-30	IC BA7755AF-E2
IC340	8-759-486-92	IC LA7256

< JUMPER RESISTOR >

Ref. No.	Part No.	Description	
JR260	1-216-295-91	SHORT	0
JS331	1-216-295-91	SHORT	0 (F900)

< COIL >

Ref. No.	Part No.	Description	
L140	1-414-940-21	INDUCTOR	100uH
L262	1-414-940-21	INDUCTOR	100uH
L263	1-414-940-21	INDUCTOR	100uH
L321	1-414-940-21	INDUCTOR	100uH
L322	1-414-940-21	INDUCTOR	100uH
L331	1-410-687-11	INDUCTOR	1.2mH (E850/E880/F990)
L341	1-414-940-21	INDUCTOR	100uH

SLV-E850B/E850UX/E880EG/F900B/F900NP/F900UX/ F900VC/F990B/F990NP/F990UX/F990VC

2029281
V01766

RMT-V222C/V222D/V222E/V223C/V240/V240A/V240B/V240C/V240D

SONY®

SERVICE MANUAL

French Model
SLV-E850B/F900B/F990B
UK Model
SLV-E850UX/F900UX/F990UX
Greek Model
SLV-E880EG
Spanish Model
SLV-F900NP/F990NP
German Model
SLV-F900VC/F990VC

SUPPLEMENT-1

File this supplement with the service manual.

(99-017)

Subject: EEP ROM INITIAL DATA INPUT

1. EEP ROM INITIAL DATA INPUT

When EEP ROM (IC182 on FR-128 board) was changed, make it sure to input the data shown below and to perform "2-3-1. RF Switching Position/AF Switching Position Adjustment ".

Input Method:

1) Connect the LANC jig (J-6090-051-A) to CN165 on MA-316 board.
2) Turn on the power.
3) Input Data: 80 in Address: 01 on Page: 00.
4) Input data on Page F as following table.
5) Turn off the power

Page		F										
Address		01	02	0A	0B	0C	0D	B4	BA	BB	BC	BD
Data	SLV-E850B	03	01	B5	CE	20	02	25	10	E1	00	10
	SLV-E850UX	03	03	85	CE	20	02	15	10	E1	00	10
	SLV-E880EG	05	0C	85	CE	20	06	20	10	E0	00	10
	SLV-F900B	0E	05	B5	CE	20	02	25	10	E1	00	10
	SLV-F900NP	0E	06	85	CE	20	02	20	10	E1	00	10
	SLV-F900UX	0E	07	85	CE	20	02	15	10	E1	00	10
	SLV-F900VC	0E	04	85	CE	20	02	20	10	E0	00	10
	SLV-F990B	0E	09	B5	CE	20	02	25	10	E1	00	10
	SLV-F990NP	0E	0A	85	CE	20	06	20	10	E1	00	10
	SLV-F990UX	0E	0B	85	CE	20	06	15	10	E1	00	10
	SLV-F990VC	0E	08	85	CE	20	06	20	10	E0	00	10

6) Disconnect the adjusting remote commander and LANC jig from the connector (CN165).

Note: When connecting or disconnecting LANC jig to CN165 on MA-316 board, first connect the adjusting remote commander (J-6082-053-B) to the jack on LANC jig before connecting LANC jig to CN165. Connection or disconnection of the adjusting remote commander in the condition LANC jig is connected to CN165 causes IC LINK (PS001) to damage itself.

9-921-688-81

Sony Corporation
Home Video Company

9910562-1
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MISCELLANEOUS

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Ref. No.	Part No.	Description	Remarks
⚠9	1-782-012-11	CORD, POWER (E850/E880/F900)	
⚠9	1-783-931-11	CORD, POWER (F990)	
11	1-762-844-21	SWITCH, ROTARY (F900)	
11	1-762-844-31	SWITCH, ROTARY (E850/E880/F990)	
12	1-783-169-11	CABLE, FLAT (FFD-2)	
14	1-783-167-11	CABLE, FLAT (FFM-18)	
21	1-777-963-11	CABLE, FLAT (FHM-3) 5P (F900/F990)	
26	1-475-584-11	SWITCH BLOCK, CONTROL (F900:VC,NP,UX)	
26	1-475-584-21	SWITCH BLOCK, CONTROL (F900:B)	
26	1-475-585-11	SWITCH BLOCK, CONTROL (F990:VC,NP,UX)	
26	1-475-585-21	SWITCH BLOCK, CONTROL (F990:B)	
55	1-783-166-11	CABLE, FLAT (FFM-17) (F900/F990)	
56	1-779-725-11	CONNECTOR, BOARD TO BOARD 5P	
M902	1-698-971-11	MOTOR, DC	
M903	X-3947-577-1	MOTOR ASSY, CAM	

ACCESSORIES & PACKING MATERIALS

****

Ref. No.	Part No.	Description	Remarks
	1-475-563-41	COMMANDER, STANDARD (RMT-V223C) (E880)	
	1-475-578-11	COMMANDER, STANDARD(RMT-V222C) (F900:VC,NP)	
	1-475-578-21	COMMANDER, STANDARD (RMT-V222D) (F900:UX)	
	1-475-578-31	COMMANDER, STANDARD (RMT-V222E) (F900:B)	
	1-475-767-11	COMMANDER, STANDARD (RMT-V240) (E850:UX)	
	1-475-767-21	COMMANDER, STANDARD (RMT-V240A) (E850:B)	
	1-475-767-31	COMMANDER, STANDARD (RMT-V240B) (F990:VC,NP)	
	1-475-767-41	COMMANDER, STANDARD (RMT-V240C) (F990:UX)	
	1-475-767-51	COMMANDER, STANDARD (RMT-V240D) (F990:B)	
	1-696-593-11	CORD, CONNECTION (PAL)(FOR RF)1.5m	
	1-696-861-11	CORD, CONNECTION (FOR AUDIO)1.5m	
	1-751-739-21	CORD, CONNECTION (F900)	
	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (F900:UX/F990:UX)	
	1-782-213-11	CABLE, CONNECTION (21P)(FOR EUROAV)1.5m	
	3-862-066-21	MANUAL, INSTRUCTION (ENGLISH)(E850:UX)	
	3-862-066-31	MANUAL, INSTRUCTION (FRENCH)(E850:B)	
	3-862-066-41	MANUAL, INSTRUCTION (ENGLISH)(E880)	
	3-862-066-51	MANUAL, INSTRUCTION (RUSSIAN)(E880)	
	3-862-066-61	MANUAL, INSTRUCTION (CZECH)(E880)	
	3-862-066-71	MANUAL, INSTRUCTION (GREEK)(E880)	
	3-864-250-11	MANUAL, INSTRUCTION (GERMAN)(F900:VC,NP)	
	3-864-250-21	MANUAL, INSTRUCTION (FRENCH)(F900:VC,NP)	
	3-864-250-31	MANUAL, INSTRUCTION (ITALIAN)(F900:VC)	
	3-864-250-41	MANUAL, INSTRUCTION (DUTCH) (F900:VC,NP)	
	3-864-250-51	MANUAL, INSTRUCTION (SPANISH)(F900:NP)	
	3-864-250-61	MANUAL, INSTRUCTION (POLISH) (F900:NP)	
	3-864-250-71	MANUAL, INSTRUCTION (SWEDISH)(F900:NP)	
	3-864-250-81	MANUAL, INSTRUCTION (GERMAN) (F900:NP)	
	3-864-250-91	MANUAL, INSTRUCTION (FINNISH)(F900:NP)	
	3-864-252-11	MANUAL, INSTRUCTION (ENGLISH)(F900:UX)	
	3-864-252-21	MANUAL, INSTRUCTION (FRENCH)(F900:B)	
	3-864-329-11	MANUAL, INSTRUCTION (GERMAN) (F990:VC,NP)	
	3-864-329-21	MANUAL, INSTRUCTION (FRENCH) (F990:VC,NP)	
	3-864-329-31	MANUAL, INSTRUCTION (ITALIAN)(F990:VC)	
	3-864-329-41	MANUAL, INSTRUCTION (DUTCH) (F990:VC,NP)	
	3-864-329-51	MANUAL, INSTRUCTION (SPANISH)(F990:NP)	
	3-864-329-61	MANUAL, INSTRUCTION (POLISH) (F990:NP)	
	3-864-329-71	MANUAL, INSTRUCTION (SWEDISH)(F990:NP)	
	3-864-329-81	MANUAL, INSTRUCTION (GERMAN) (F990:NP)	
	3-864-329-91	MANUAL, INSTRUCTION (FINNISH)(F990:NP)	
	3-864-334-11	MANUAL, INSTRUCTION (ENGLISH)(F990:UX)	
	3-864-334-21	MANUAL, INSTRUCTION (FRENCH) (F990:B)	
	3-864-334-31	MANUAL, INSTRUCTION (GREEK) (F990:VC)	
	3-971-712-01	PLUG, PROTECTION (F900:UX/F990:UX)	

****

HARDWARE LIST

****

Ref. No.	Part No.	Description	Remarks
#1	7-685-648-79	SCREW +BVTP 3X12 TYPE2	
#2	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3	
#701	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3	
#702	7-682-547-04	SCREW +P 3X6	
#703	7-685-133-19	SCREW (DIA. 2.6) (IT3B)	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	**Note :** Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

9-921-688-11

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Home A&V Products Company

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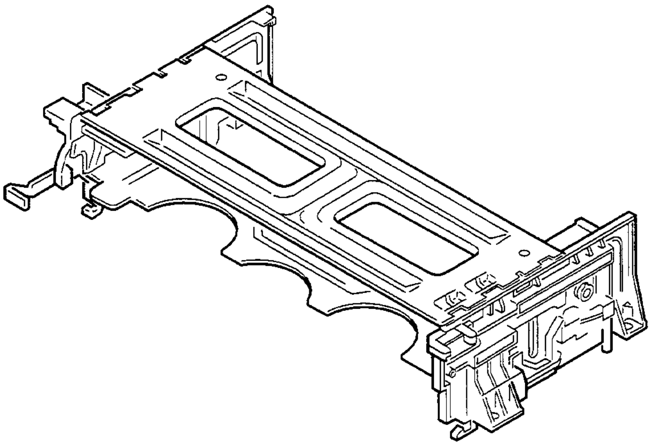
VHS MECHANICAL ADJUSTMENT MANUAL VI

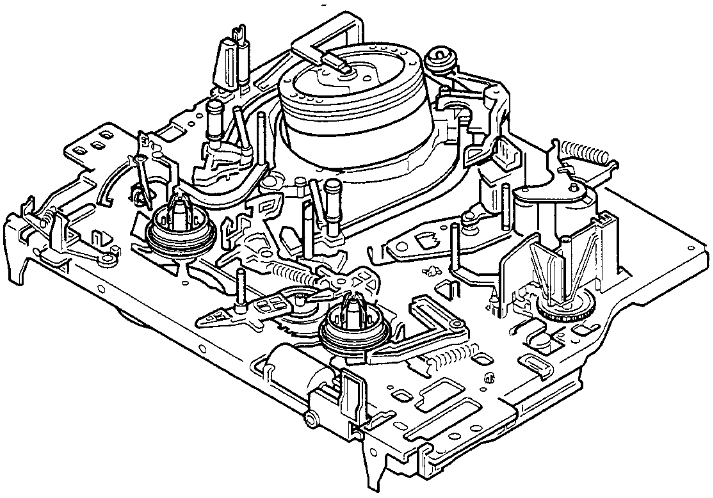
V21298

S MECHANISM

VHS

Please use with the service manual.





VHS TAPE TRANSPORT MECHANISM DECK

MICROFILM

SONY®

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ADJUSTMENTS REQUIRED THE FOLLOWING PARTS REPLACEMENT

	ADJUSTMENTS	4-1-1	4-1-2	4-1-3	4-1-4	4-1-5	4-1-6	4-1-7	4-1-8
	PARTS	TENSION REGULATOR POSITION/TENSION ADJUSTMENT	CHECKING THE TENSION AND TORQUE	X-VALUE ADJUSTMENT	HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6	ACE HEAD HEIGHT AND AZIMUTH ADJUSTMENT	X-VALUE FINE ADJUSTMENT	HEIGHT ADJUSTMENT OF GUIDE ROLLER NO. 8	CHECKING THE LINEARITY AND FLUCTUATION OF THE RF OUTPUT
3-25	REEL (S) TABLE	O	Δ	X	Δ	X	X	X	X
3-25	TG1 ASSEMBLY	O	X	X	Δ	X	X	X	X
3-6	FEH ASSEMBLY	X	X	X	Δ	X	X	X	X
3-23	DRUM BASE	X	X	O	O	O	O	O	O
3-2	DRUM ASSEMBLY	X	X	O	O	O	O	O	O
3-24	SHUTTLE (S) AND SHUTTLE (T) BLOCK ASSEMBLIES	X	X	O	O	O	O	O	X
3-5	ACE HEAD BLOCK	X	X	O	Δ	O	O	Δ	X
3-4	CAPSTAN MOTOR	X	X	X	Δ	O	O	O	X
3-3	PINCHI PRESS BLOCK ASS'Y	X	X	X	X	O	O	O	X
3-3	TG8 ASSEMBLY	X	X	X	X	X	X	O	X
3-10	REEL (T) TABLE	X	X	X	X	X	X	Δ	X
3-19	PULLEY GEAR ASSEMBLY	X	O	X	X	X	X	X	X
3-11	PENDULUM ARM ASSEMBLY	X	O	X	X	X	X	X	X

O: ADJUST
Δ: CHECK
X: NOT REQUIRED

1. PREPARATION FOR MECHANISM CHECKS, ADJUSTMENTS AND REPLACEMENT

For removal of the cabinet, printed wiring boards and others, please refer to the service manual "DISASSEMBLY".

1-1. LOADING AND THREADING PROCEDURE WHEN THE POWER TURNS OFF

1-1-1. LOADING AND THREADING PROCEDURE WITH HANDS

1) Turn cam motor in the arrow Ⓐ direction until loading and threading are end.

1-1-2. LOADING AND THREADING PROCEDURE WITH REGULATED DC POWER SUPPLY

1) Applying approx. +9V (300mA) to cam motor with regulated DC power supply makes it loading and threading.

Note : When loading and threading without cassette, claws are caught in four positions as following figure (in the order ①-②-③-④).
So release them with hands.

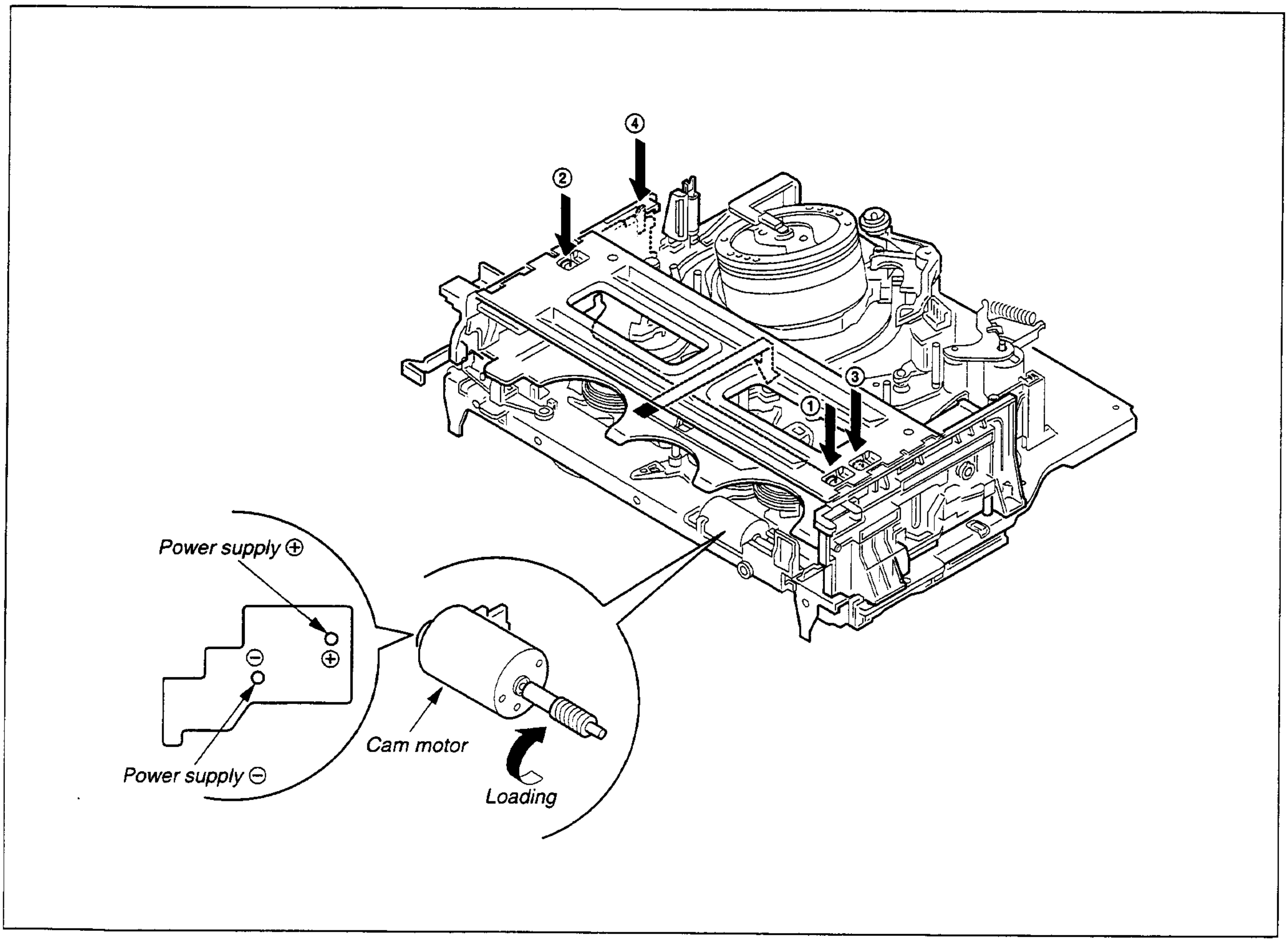


Fig. 1-1

1-2. UNLOADING AND UNTHREADING PROCEDURE WHEN THE POWER TURNS OFF

1-2-1. UNLOADING AND UNTHREADING PROCEDURE WITH HANDS

1) Turn cam motor in the arrow Ⓑ direction until unthreading is end.
2) Turn capstan motor in the arrow Ⓒ direction to take up tape in cassette.
3) Turn cam motor in the arrow Ⓑ direction until unloading is end.

1-2-2. UNLOADING AND UNTHREADING PROCEDURE WITH REGULATED DC POWER SUPPLY

1) Apply approx. +5V (300mA) to contrary polarities of cam motor.
2) Unthreading operation begins, tape guides return to their initial positions (Unthreading operation is end but tape remains), then stop cam motor by turning power off.

Note : When unloading begins and cassette lid is closed, turn cam motor in the arrow Ⓐ direction to open tape guard.

3) Turn capstan motor in the arrow Ⓒ direction to take up tape in cassette.

Note : Take care that tape is not caught at pinch roller.

4) Check that tape is no loosened completely, and apply approx. +5V (300mA) to contrary polarities of cam motor with regulated DC power supply.

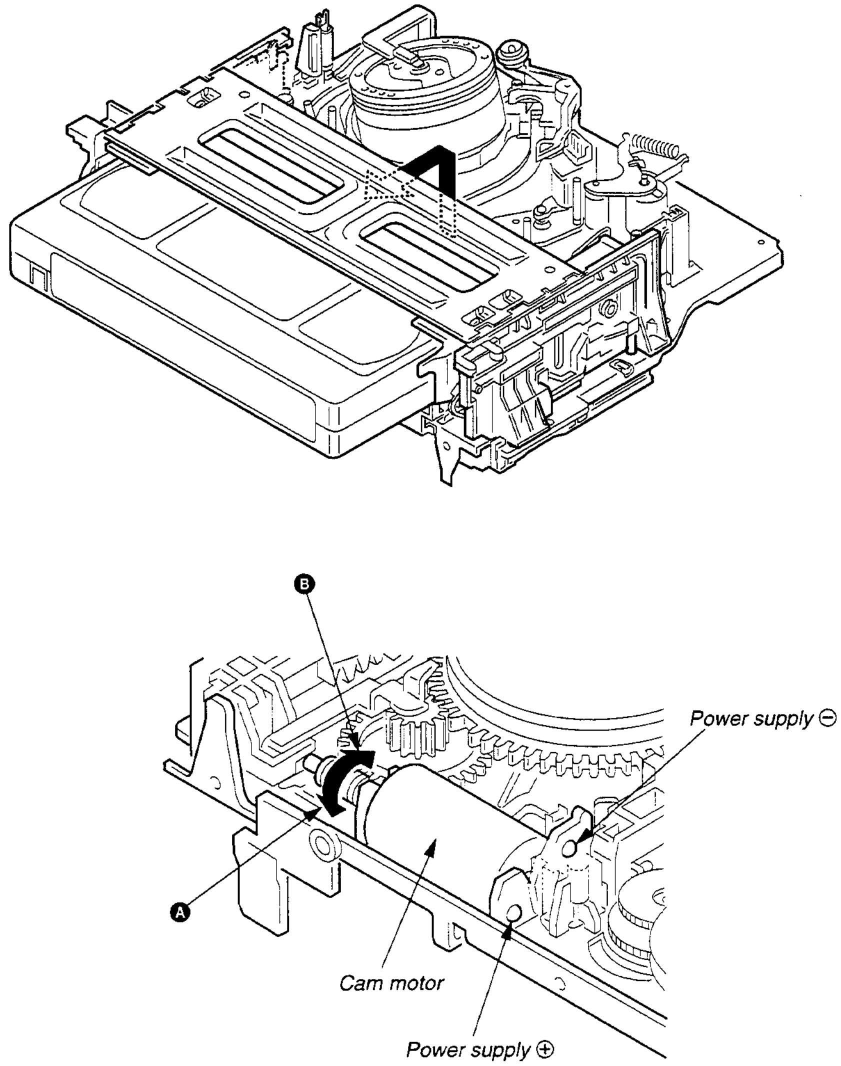


Fig. 1-2

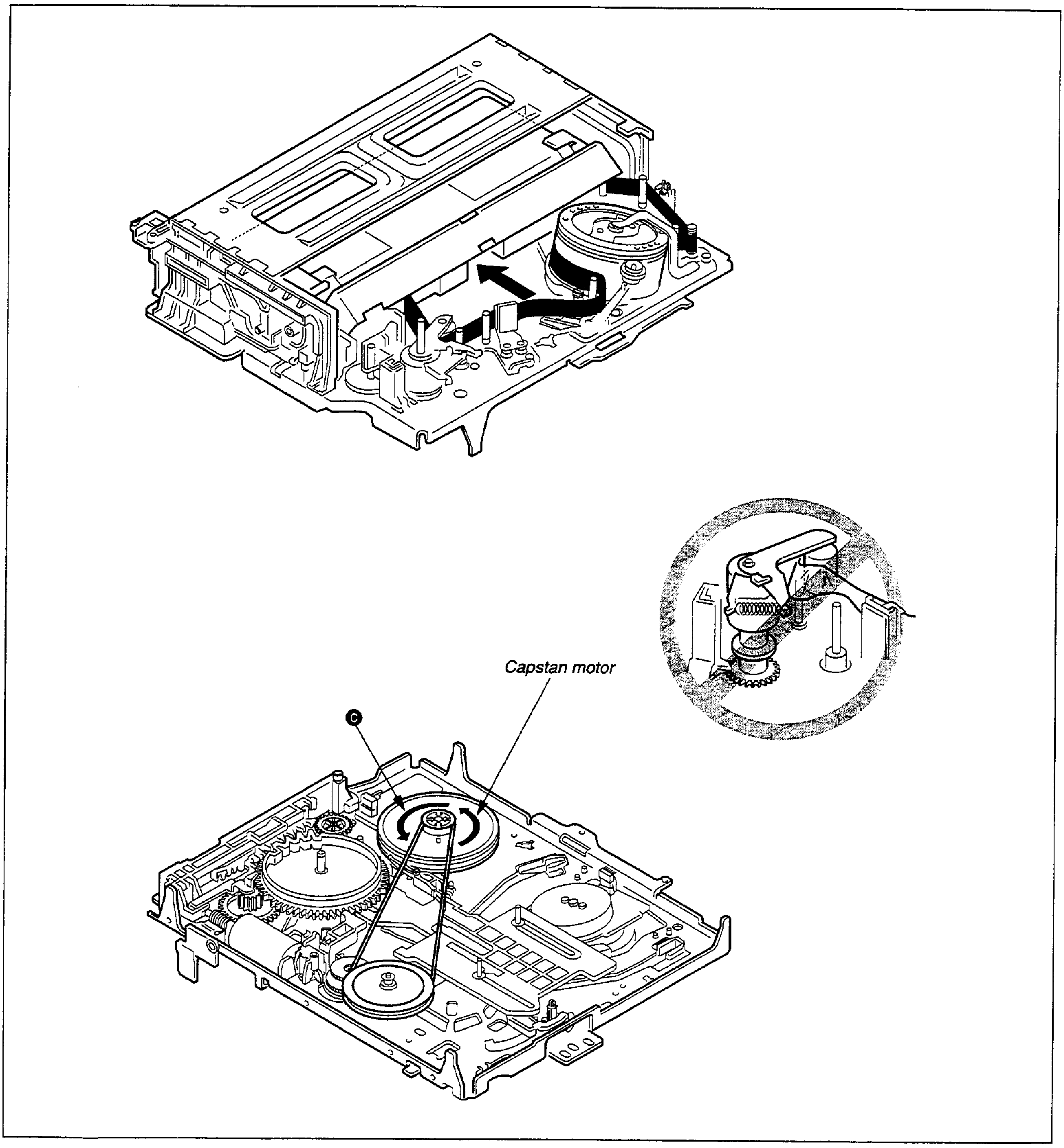

C
Capstan motor

Fig. 1-3

1-3. HOW TO COMPLETE THREADING WITHOUT CASSETTE COMPARTMENT

Note 1 : Put the FL block assembly removed the FL top plate on the bottom not to put dust or grease the top sensor and the end sensor luminous plates or not to scratch them.

1) Pull out AC plug from wall outlet.
2) Shade near the end and top sensors with a black masking tape or the like.
3) Connect AC plug to wall outlet.

Note 2 : In this condition, some modes can not be set.
To make loading in this condition, set the video cassette tape without REC proof claw, pull the REC proof lever once and release it.
On loading without video cassette tape, it is necessary to deceive the microcomputer by turning the reel (T) table with hand.
Fast forward and rewind are not available.

Note 3 : After above mentioned operation, be sure to return the mode in the following order.

4) Pull out AC plug from wall outlet to reset the system control microcomputer.
5) Remove the tape near the end and top sensors.

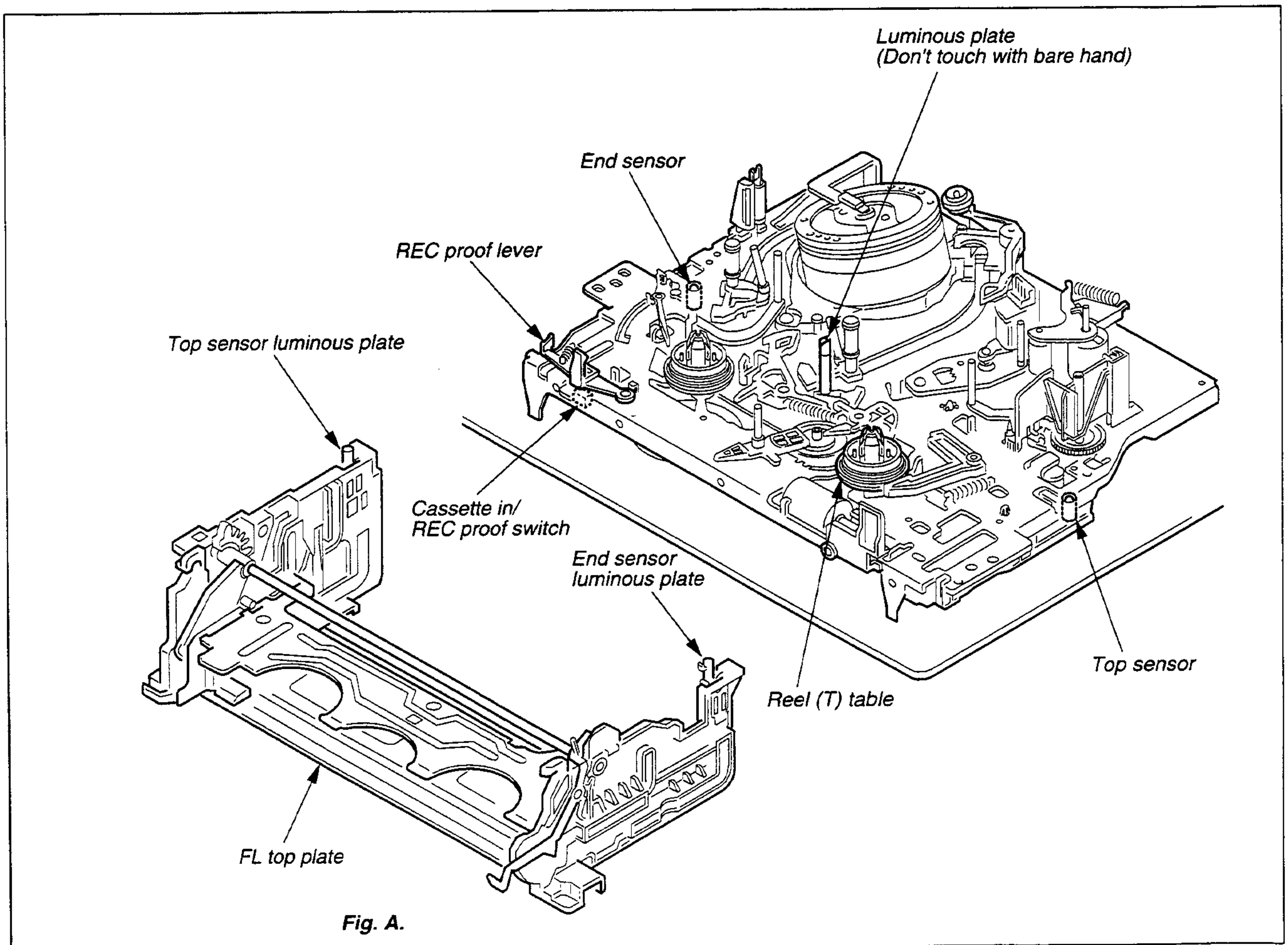

Luminous plate
(Don't touch with bare hand)
End sensor
REC proof lever
Top sensor luminous plate
Cassette in/
REC proof switch
End sensor
luminous plate
Top sensor
Reel (T) table
FL top plate
Fig. A.

Fig. 1-4

2. PERIODIC CHECK AND REPLACEMENT

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes, it is recommended that the following periodic checks and maintenance be performed.

* The following must be done after every repair regardless of how many hours the user has operated the machine.

2-1. CLEANING OF ROTATING HEAD DISK ASSEMBLY

1) Press a chamois cloth (Jig Ref. No. J-4) which has been dipped in cleaning fluid (Jig Ref. No. J-3) lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by the hand. (Never try to clean by using the motor to turn it.)
2) Never try to clean by moving the chamois cloth at a vertical angle to the head tip. There is a very great danger of damaging the head tip if this is done.

2-2. CLEANING OF THE TAPE MOVEMENT SYSTEM

1) Clean the surfaces which the tape contacts during its movement (tape guide, drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in cleaning fluid.

2-3. CLEANING THE DRIVE SYSTEM

1) Clean the driving parts with a cloth that has been dipped in cleaning fluid.

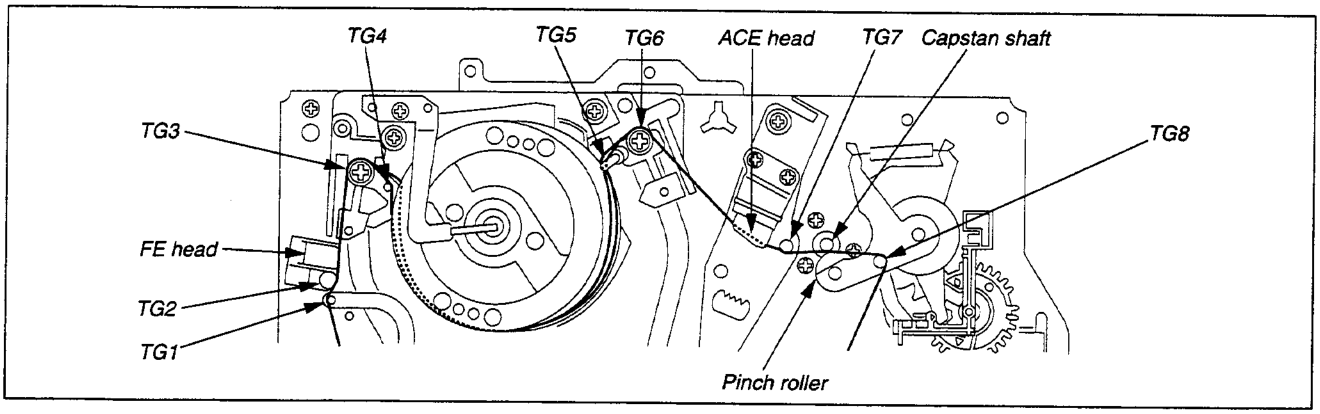


Fig. 2-1 Parts requiring cleaning

2-4. PERIODIC CHECK ITEMS

Perform the maintenance and check listed on the table below, according to users' operating hours.

Maintenance & Check \ Operating Hours (H)		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Tape Transportation System	Cleaning of tape transportation system	○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning and degaussing of ACE assembly	○	○	○	○	○	○	○	○	○	○	
	Cleaning and degaussing of upper drum assembly	○	○	○	○	○	○	○	○	○	○	The life of the head varies, depending on operational conditions and method.
Performance Confirmation	Abnormal sound	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section which causes abnormal sound.
	Measurement of FWD back tension	—	☆	—	☆	—	☆	—	☆	—	☆	Confirmation must be made according to 4-1-1. Specified value : Adjust to 5.0504 to 6.5214mN•m (51.5 to 66.5g•cm) (without TC assembly*) or 3.7755 to 5.0994mN•m (38.5 to 52.0g•cm)(with TC assembly*)
	Confirmation of brake system	—	☆	—	☆	—	☆	—	☆	—	☆	Confirmation must be made according to section.
	Confirmation of record and playback functions	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	Measurement of forward torque	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust to 4.9033 to 8.8259mN•m (50 to 90 g•cm)

○ : Cleaning ☆ : Confirmation

Note : On overhaul
When overhauling the unit, replace parts as indicated in the above table.

2-5. TOOLS AND FIXTURES REQUIRED FOR SERVICING

Ref. No.	Name		Part No.	Caved Jig No.	Remarks
J-1	Torque Measurement Cassette VHT-103S		J-6090-072-A		For FWD & back tension torque measurement.
	Torque Measurement Cassette VHT-404S		J-6082-012-A		For CUE and REVIEW torque measurement.
J-2	Alignment Tape	KRV-52NE* (NTSC)	8-192-605-41		Tape path, Audio azimuth, X-value adjustments
		KRV-51N2 (NTSC)	8-192-605-32		Electrical adjustments, Operation checks
		KRV-52PL (PAL)	8-192-605-46		Tape path, Audio azimuth, X-value adjustments
		KRV-51P (PAL)	8-192-605-36		Electrical adjustments, Operation checks
J-3	Cleaning fluid		Y-2031-001-0	—	
J-4	Chamois Leather		2-034-697-00	—	
J-5	Dental Mirror (With Handle) Dental Mirror (Mirror)		J-6080-029-A J-6080-030-1	SL-5052	Tape path and tape traveling adjustments or checks.
J-6	FLOIL SG-646		7-651-000-44		Net. 20g
J-7	Diamond Oil NT-68		7-661-018-18		
J-8	Screw Lock G (1401B)		7-432-114-11		
J-9	X-value adjusting driver		J-6090-073-A		X-value adjustment
J-10	Mode Selector Ⅱ		J-6082-282-A	—	For S mechanism stand-alone operation
J-11	Connector Conversion Jig		J-6090-052-A	—	For S mechanism stand-alone operation
J-12	S Type Capstan Board		J-6090-075-A	—	For S mechanism stand-alone operation

* Be sure to use KRV-52NE having version number.

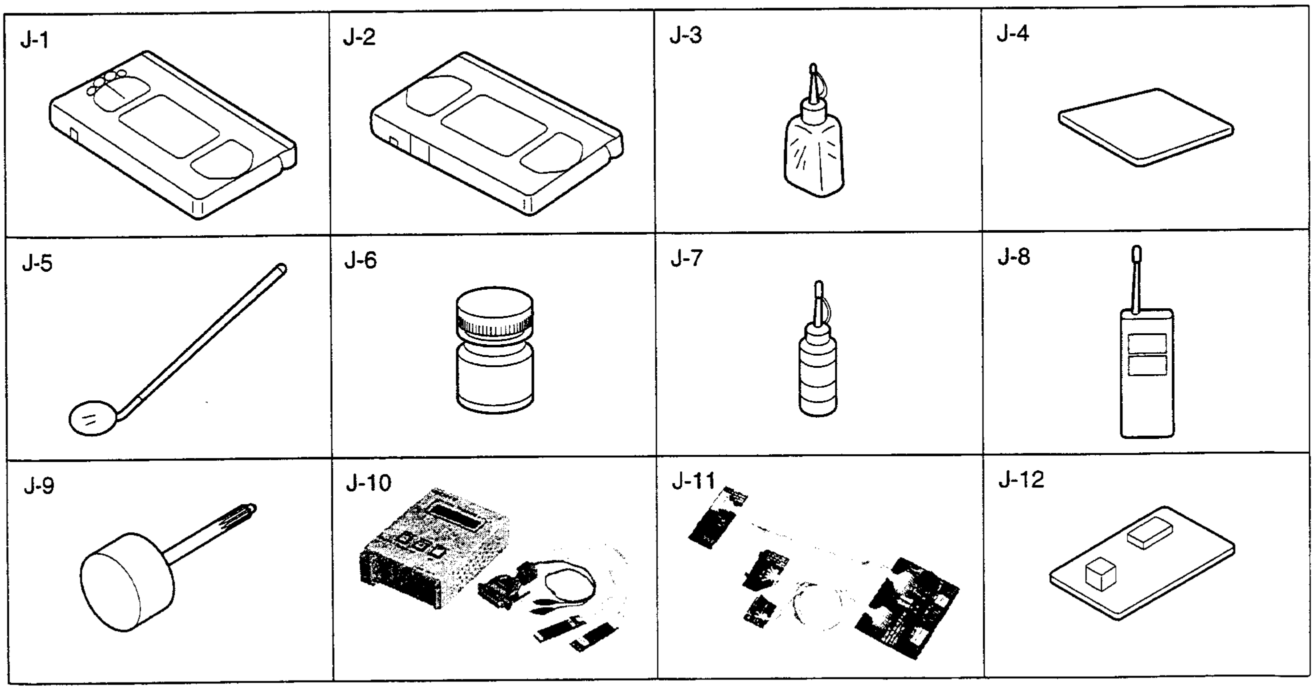


Fig. 2-2

2-6. HOW TO USE THE MODE SELECTOR II FOR ADJUSTING S TYPE MECHANISM ASSEMBLY

2-6-1. OUTLINE

To activate the VHS system S type mechanism assembly using mode selector II (J-6082-282-A), use connector conversion jig (J-6090-052-A) and the S type capstan board (J-6090-075-A). By using the connector conversion jig and the S type capstan board, the following operations are possible.

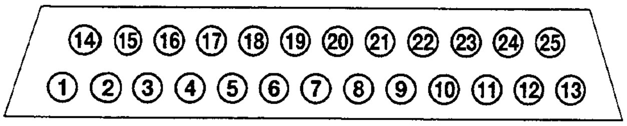
- Loading and unloading action by the loading motor.
- Normal and reverse rotation of the capstan motor.

2-6-2. PREPARATION

1) In order to drive the capstan motor, the power +5V and +12V are supplied from the Mode Selector II. Disassemble the D-SUB connector of the Mode Selector cable, then solder the following three places.

Supplied 3-pin cable	D-SUB connector of the Mode Selector II	Voltage
Pin 1 (Red index)	Pin 20	+12V
Pin 2	Pin 25	GND
Pin 3	Pin 24	+5V

- Connector pin number assignment of the D-SUB connector (From the soldering side)



- When connections are made, check that +5V and +12V are available at the 3-pin cable connector.

2) CHECKING THE SOFTWARE VERSION
Turn on the power of the Mode Selector II.
If the reading of the software version on the Mode Selector II is not 1.10 or higher, replace the new ROM (J-6082-314-A).

2-6-3. CONNECTION

1) S TYPE CAPSTAN BOARD ATTACHMENT
Replace the capstan board supplied with the connector conversion jig (J-6090-052-A) with the S type capstan board (J-6090-075-A).
2) CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE MODE SELECTOR II.
Insert the connectors of the two 6-pin cables (one is white and the other is black) and the 3-pin cable from the Mode Selector II to the corresponding connectors on the connector conversion jig (J-6090-052-A).
3) CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE S TYPE MECHANISM ASSEMBLY
With the power of the Mode Selector II turned off, insert the following two connectors to the corresponding connectors on the S type mechanism assembly.
    - 3-pin connector for the loading motor
    - 10-pin connector for the capstan motor

   Set the speed control for the minimum setting (fully counterclockwise).

2-6-4. OPERATION

1) OPERATION OF THE LOADING MOTOR ON THE S TYPE MECHANISM ASSEMBLY
① Select the H type mechanism assembly setting on the Mode Selector II.
② Operating procedures after the mechanism selection
For the operating procedures, see pages 3 to 5 of "8mm Video Mechanical Adjustment Manual IV (TK Mechanism) Supplement-1".
For the loading procedure, see page 4 of "VHS Mechanical Adjustment manual IV (S Mechanism)".
2) OPERATION OF THE CAPSTAN MOTOR ON THE S TYPE MECHANISM ASSEMBLY
① By the loading motor operation under the item 1), change the mode setting to the FF/REW mode.
② Turn the speed control gradually in clockwise direction, then the capstan motor starts rotating. To turn the capstan motor in desired rotating direction, change the FF/REW setting of the rotating direction switch.

2-6-5. PRECAUTIONS

- Turn the speed control only when necessary. Otherwise, hold the speed control turned at fully counterclockwise direction. If the power of the Mode Selector II is turned on with the speed control turned in clockwise direction, +12V power fails and the power of the Mode Selector II cannot be turned on.
- Although the connector conversion jig (J-6090-052-A) has rubber feet, do not make a short circuit on the bottom surface of the connector conversion jig via peripheral conductive materials.

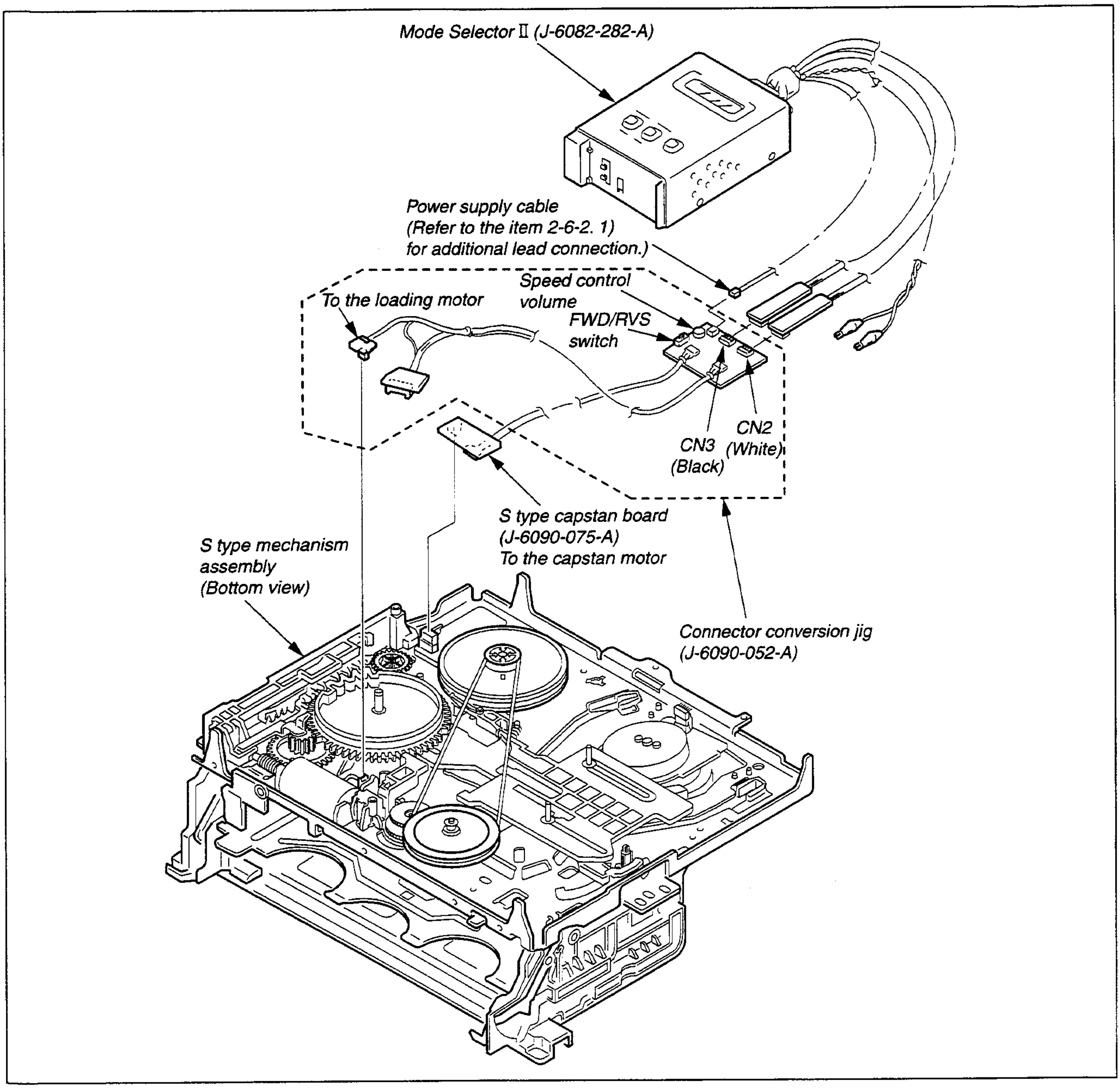

Mode Selector II (J-6082-282-A)
Power supply cable
(Refer to the item 2-6-2. 1)
for additional lead connection.)
Speed control
volume
To the loading motor
FWD/RVS
switch
CN2
(White)
CN3
(Black)
S type capstan board
(J-6090-075-A)
To the capstan motor
S type mechanism
assembly
(Bottom view)
Connector conversion jig
(J-6090-052-A)

Fig. 2-3

2-6-6. CHECKING THE MECHANISM MODE BY THE MARK CARVED ON THE SLIDER

As shown in the right figure, the mechanism mode can be identified by checking the mark carved on the slider pointed by the loading gear shaft.

Carved mark	Mode
CD	Cassette down
EJ	Eject
UL	Unload end
LE	Load end
RV	Reverse
PR	Pinch release
FP	FWD pause
FW	FWD
ST	Stop
FR	FF/REW

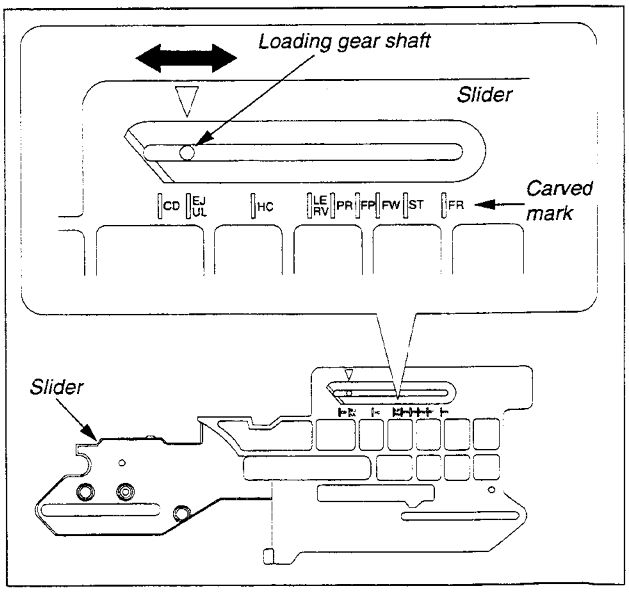
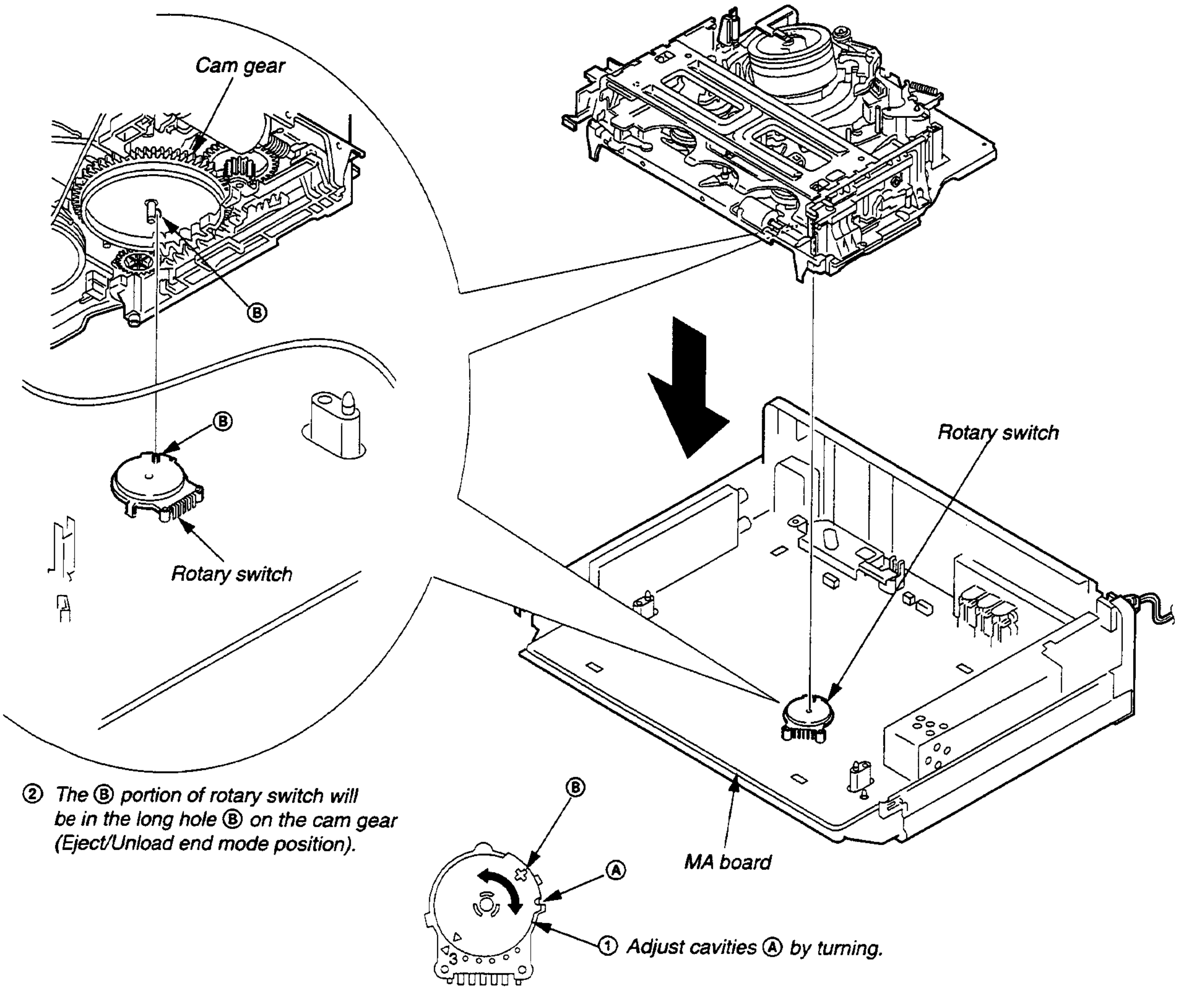

Loading gear shaft
Slider
CD
EJ
UL
HC
LE
RV
PR
FP
FW
ST
FR
Carved mark
Slider

Fig. 2-4

2-7. PHASE ADJUSTMENT ON ATTACHING S TYPE MECHANISM ASSEMBLY

As shown below, adjust the phase between the rotary switch on the MA board and the cam gear.


Cam gear
Ⓑ
Ⓑ
Rotary switch
Rotary switch
MA board
Ⓑ
Ⓐ

② The Ⓑ portion of rotary switch will be in the long hole Ⓑ on the cam gear (Eject/Unload end mode position).

① Adjust cavities Ⓐ by turning.

Fig. 2-5

3. MAINLY MECHANICAL PARTS REPLACEMENT

Notes:

For the removal of cabinets, printed circuit boards or the like, please refer to the "DISASSEMBLY" section on the service manual of the respective models.

To assemble the mechanical parts which are disassembled in the following sections, perform the disassembly steps in reverse, unless otherwise specified.

When replacing greased parts, grease them in the same way.

Do not oil, grease or touch with bare hands the surfaces that contacts tape of guides and brake shoes.

Install gears to engage each other.

Basically, disassembling and assembling should be done in the unthreading-end condition.

3-1. FL COMPLETE ASSEMBLY

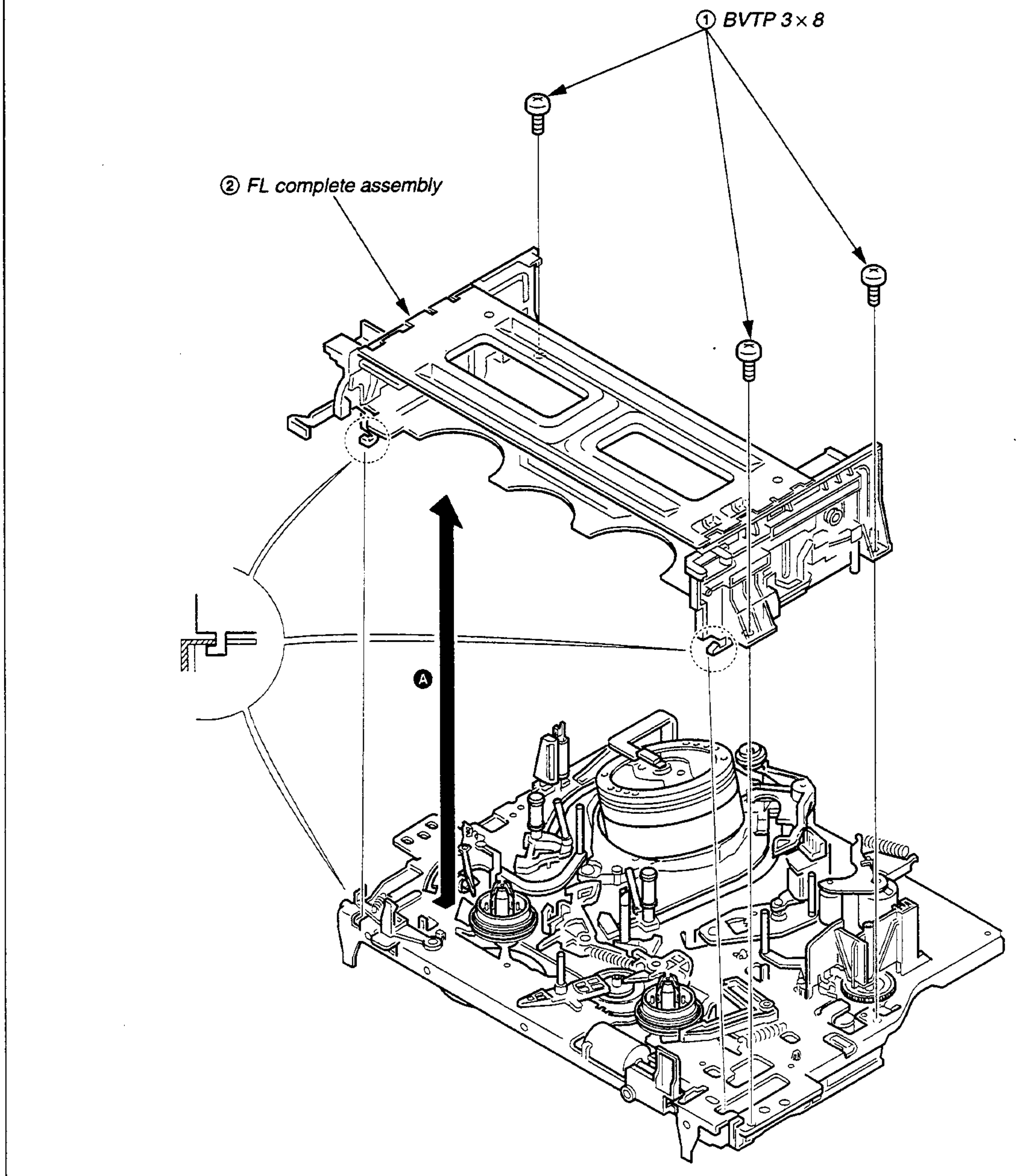
1) Remove screws (BVTP3 × 8) ①.
2) Remove FL complete assembly ② in the arrow Ⓐ direction.

Note : Be careful not to damage claws on the bottom and front.

3) Remove torsion spring (deck open) ③.
4) Remove luminous plate (top sensor) ④ and luminous plate (end sensor) ⑤.

[Note on Mounting]

- When mounting FL complete assembly, first insert claws on the bottom and front not to damage.
- Keep clean top sensor and end sensor luminous plates.



Screw tightening torque
① : 0.7845 ± 0.0784N•m (8.0 ± 0.8kg•cm)

Fig. 3-1

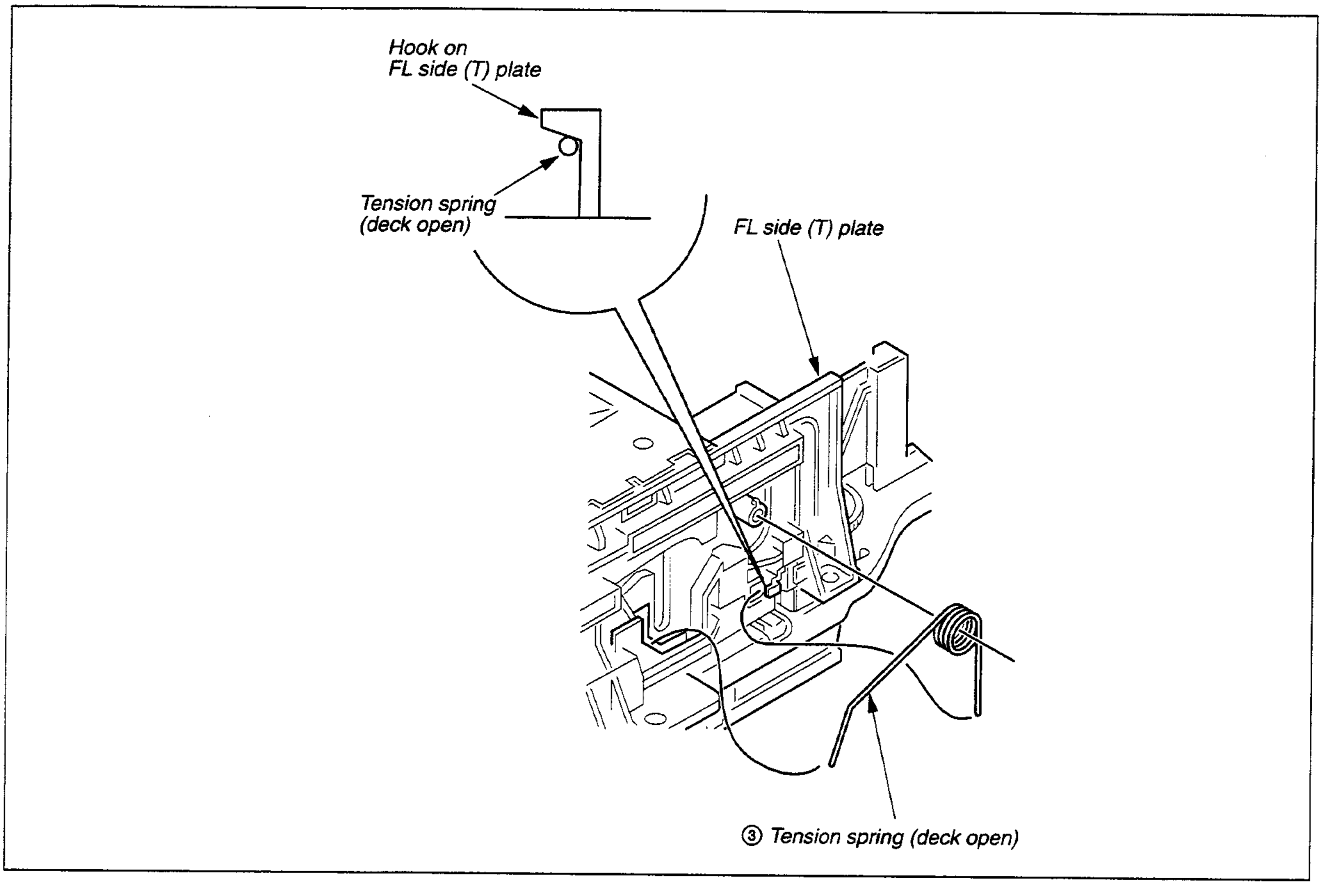

Hook on
FL side (T) plate
Tension spring
(deck open)
FL side (T) plate
③ Tension spring (deck open)

Fig. 3-2

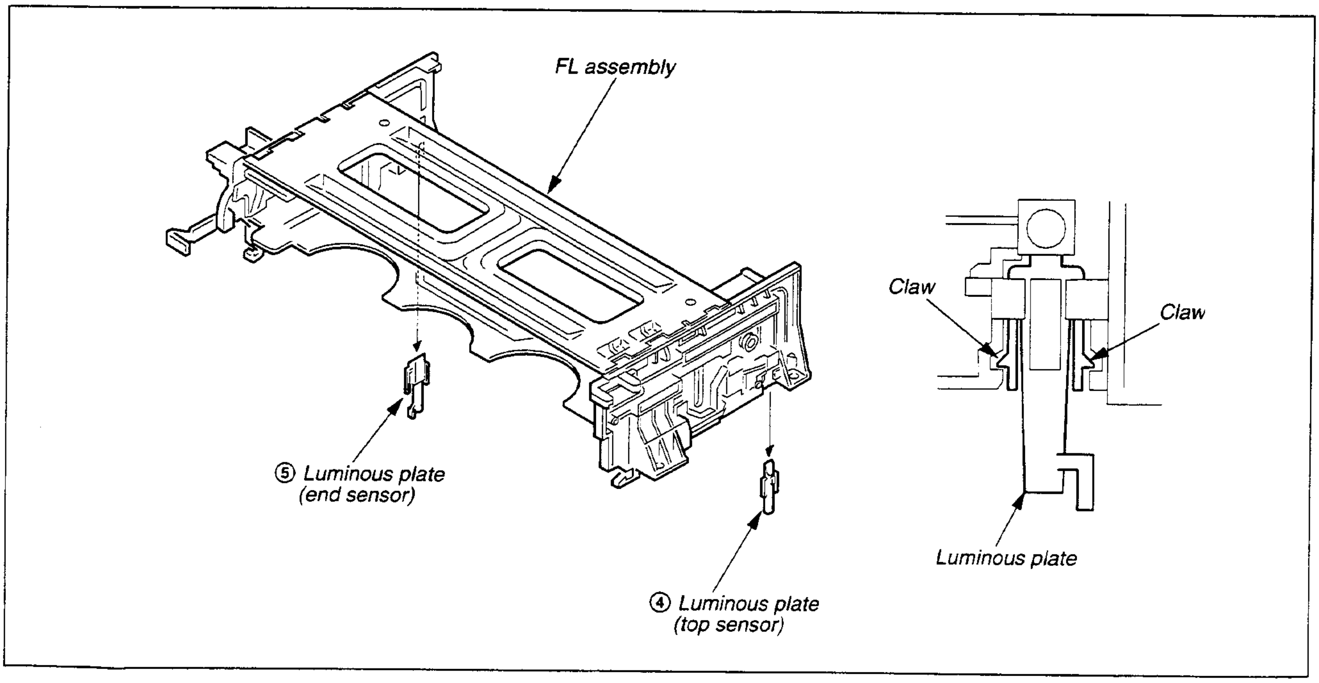

FL assembly
⑤ Luminous plate
(end sensor)
④ Luminous plate
(top sensor)
Claw
Claw
Luminous plate

Fig. 3-3

3-2. DRUM ASSEMBLY

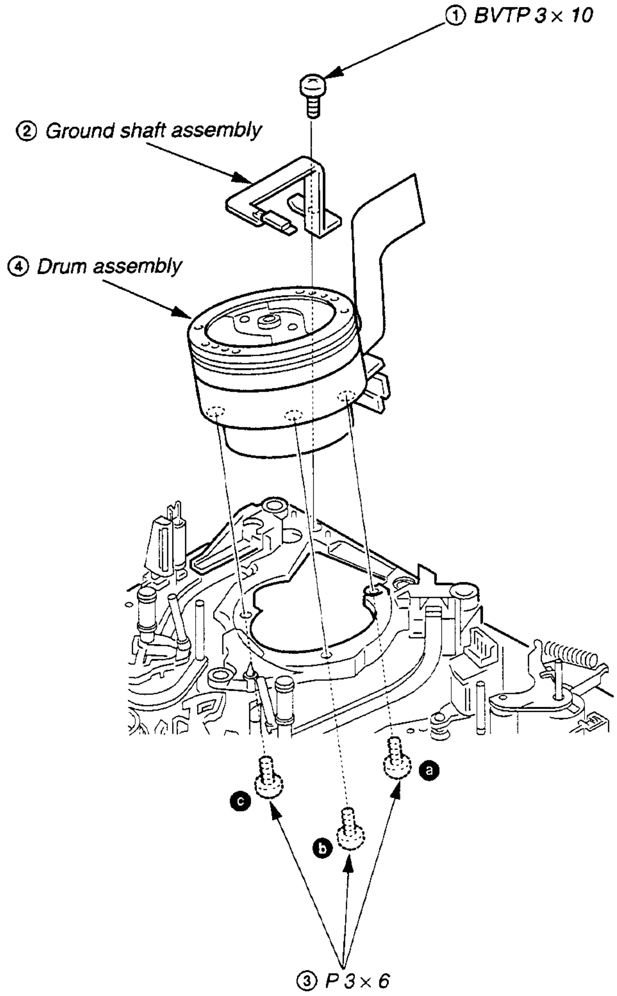
1) Remove screw (BVTP3 × 8) ①.
2) Remove ground shaft assembly ② not to touch its tip with bare hand.
3) Remove screws ③ to remove drum assembly ④.

[Notes on Mounting]

- Don't touch head chips and tip of ground shaft assembly with bare hand.
- Keep clean the surface that contacts tape of drum assembly.
- Tighten screw ③ in the order ⓐ, ⓑ, ⓒ.

[Adjusting after Mounting]

- 4-1. Tape path adjustment


① BVTP 3 × 10
② Ground shaft assembly
④ Drum assembly
ⓐ
ⓒ
ⓑ
③ P 3 × 6

Screw tightening torque
①, ③ : 0.4413 ± 0.0490N•m (4.5 ± 0.5kg•cm)

Fig. 3-4

3-3. PINCH PRESS BLOCK ASSEMBLY, TG8 ASSEMBLY AND THEIR PERIPHERY

1) Remove pinch press block assembly ① while releasing its tip from the claw of lid opener ②.
2) Remove lid opener ② while releasing claw in the arrow **A** direction from mechanical chassis.
3) Remove elevator gear ③.
4) Remove TG8 assembly ④, TG8 arm gear ⑤ and TG8 arm driving gear ⑥.
5) Then remove pinch pressing gear ⑦.

[Notes on Mounting]

- When attaching pinch pressing gear ⑦ and elevator gear ③, be sure to adjust their phases as shown in Fig. A.
- Apply grease to elevator gear ⑦ and pinch shaft as shown in Fig. B.
- Don't touch surface of pinch roller with bare hand.

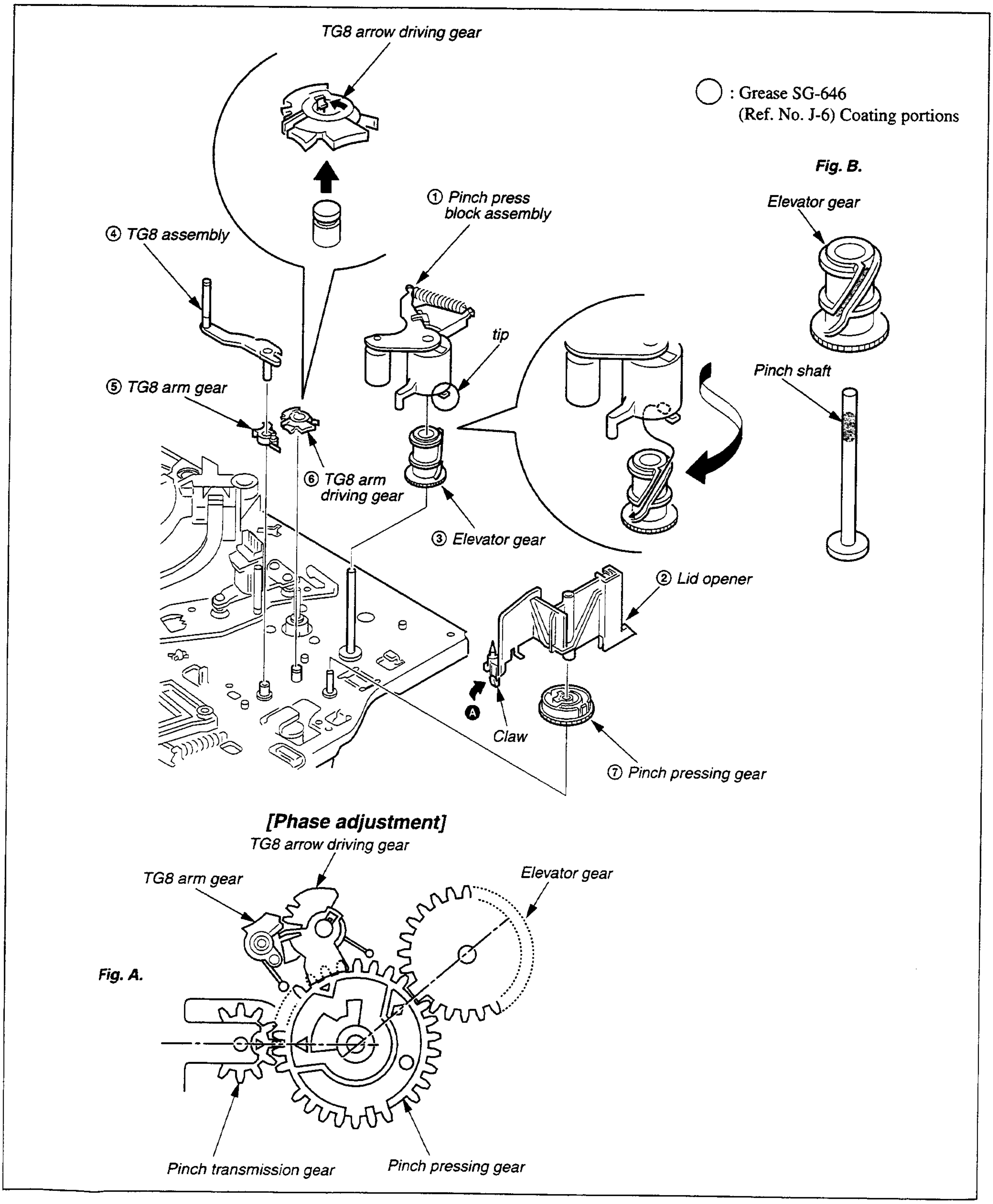

TG8 arrow driving gear
○ : Grease SG-646 (Ref. No. J-6) Coating portions
Fig. B.
Elevator gear
Pinch shaft
① Pinch press block assembly
④ TG8 assembly
tip
⑤ TG8 arm gear
⑥ TG8 arm driving gear
③ Elevator gear
② Lid opener
A
Claw
⑦ Pinch pressing gear
[Phase adjustment]
TG8 arrow driving gear
TG8 arm gear
Elevator gear
Fig. A.
Pinch transmission gear
Pinch pressing gear

Fig. 3-5

3-4. RUBBER BELT, CAPSTAN MOTOR

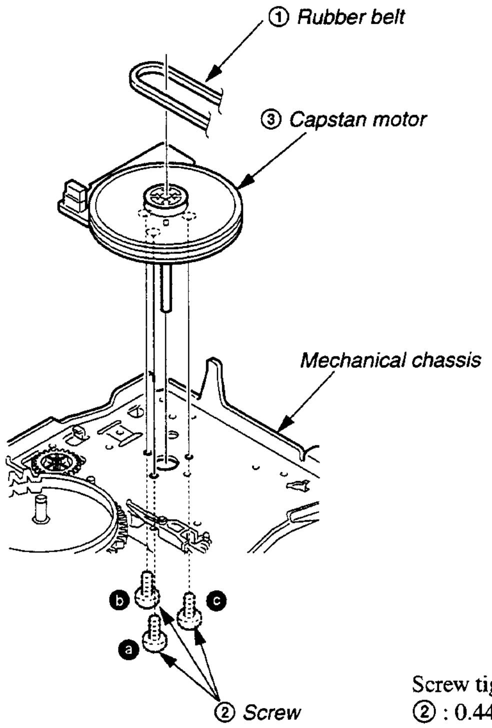
1) Remove rubber belt ①.
2) Remove screws ② to pull out capstan motor ③.

[Notes on Mounting]

- Attach rubber belt not to twist it.
- Don't touch capstan motor with bare hand to keep clean capstan motor.
- Tighten screws ② in the order ⓐ, ⓑ, ⓒ.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.


① Rubber belt
③ Capstan motor
Mechanical chassis
ⓑ
ⓒ
ⓐ
② Screw

Screw tightening torque
② : 0.4413 ± 0.0490N•m (4.5 ± 0.5kg•cm)

Fig. 3-6

3-5. ACE HEAD BLOCK ASSEMBLY

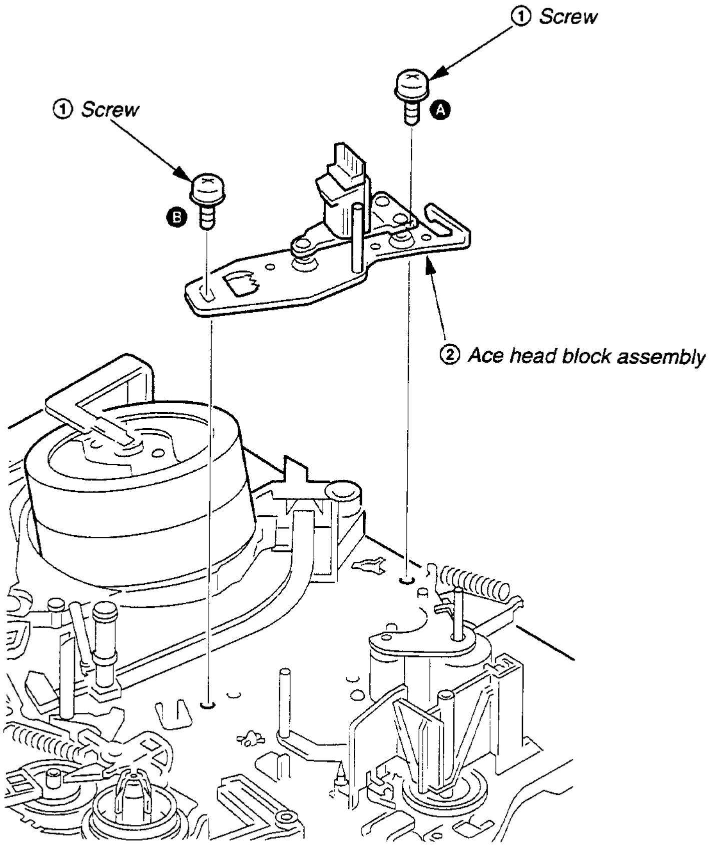
1) Remove screws ① to remove ACE head block assembly ②.

[Notes on Mounting]

- Don't touch capstan motor with bare hand to keep clean capstan motor.
- On tightening screws ①, first, tighten in the order 🅐, 🅑, next loosen 🅑 180 degrees or more and perform adjustments. After adjustments tighten with torque screwdriver (torque; 0.29 ± 0.29 N•m (3.0 ± 0.3kg•cm)).

[Adjustment after Mounting]

- 4-1. Tape path adjustment.



Screw tightening torque
① : 0.7845 ± 0.0784N•m (8.0 ± 0.8kg•cm)

Fig. 3-7

3-6. FEH ASSEMBLY

1) While putting the boss out from mechanical chassis, turn FEH assembly ① in the arrow Ⓐ direction and pull out FEH assembly above.
2) Slide FE head ② out from FEH holder not to break claw (Recorder only).
3) Remove TG2 shaft ③ by pushing with a screwdriver covered with cloth or the like not to scratch the surface.

[Note on Mounting]

- Don't touch FE head and TG2 shaft with bare hand.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

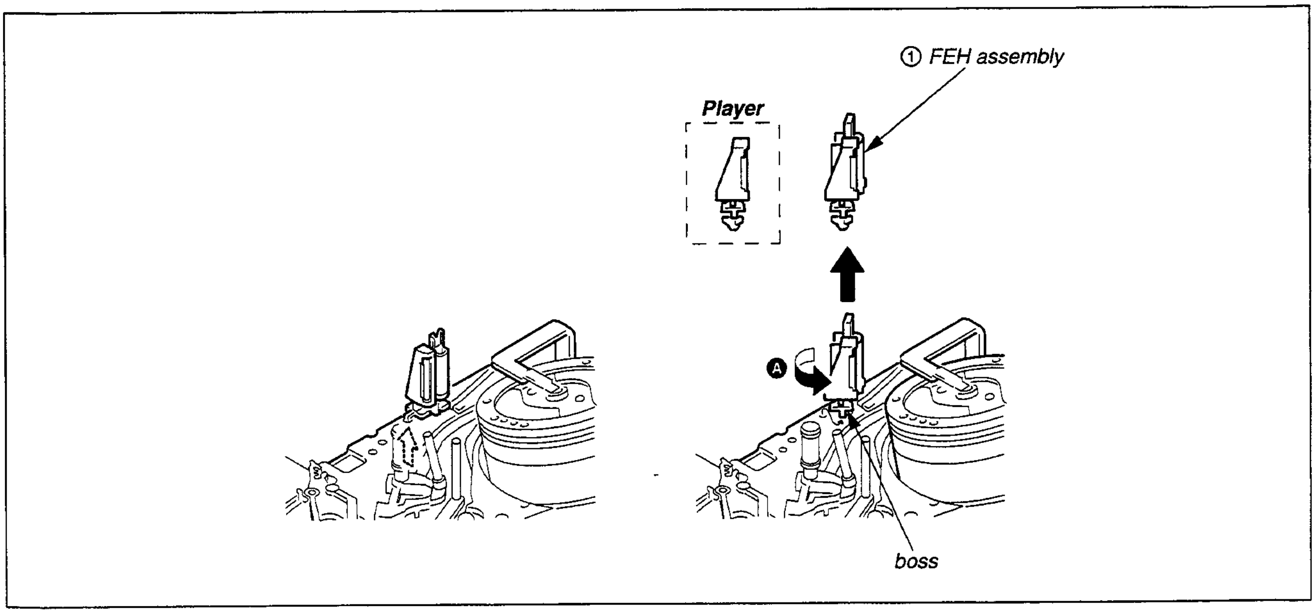

① FEH assembly
Player
Ⓐ
boss

Fig. 3-8

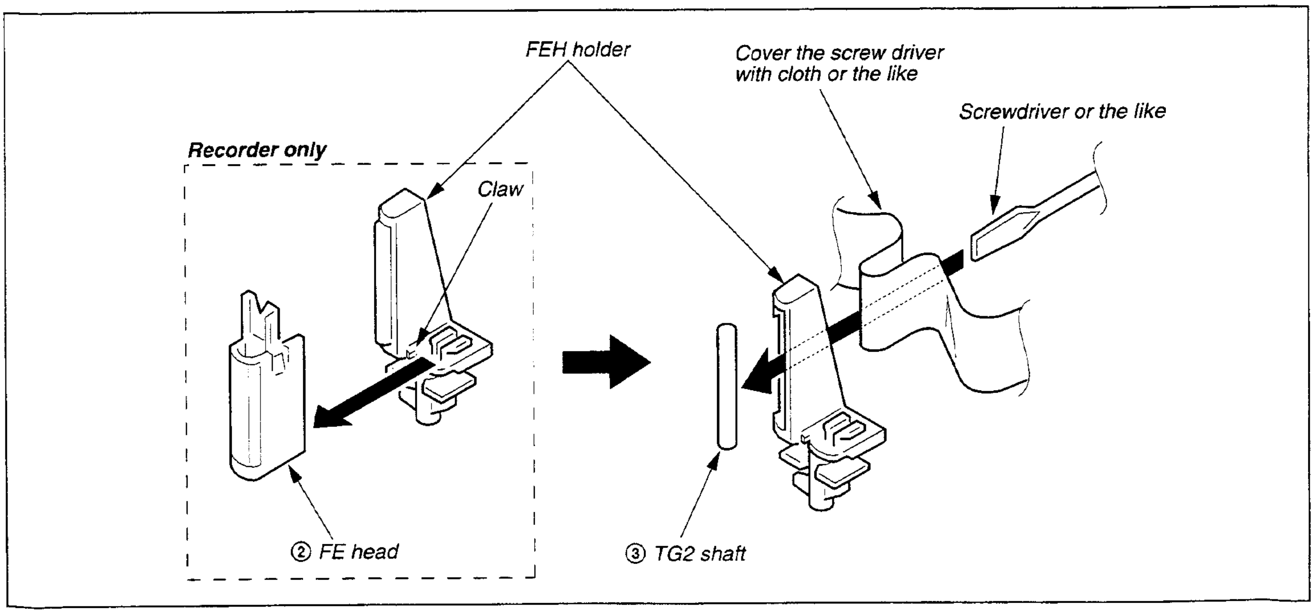

FEH holder
Cover the screw driver with cloth or the like
Screwdriver or the like
Recorder only
Claw
② FE head
③ TG2 shaft

Fig. 3-9

3-7. REC PROOF LEVER

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove tension spring (REC proof) ①.
3) Remove REC proof lever ② in the arrow 🅑 by pushing claw in the arrow 🅐 direction.

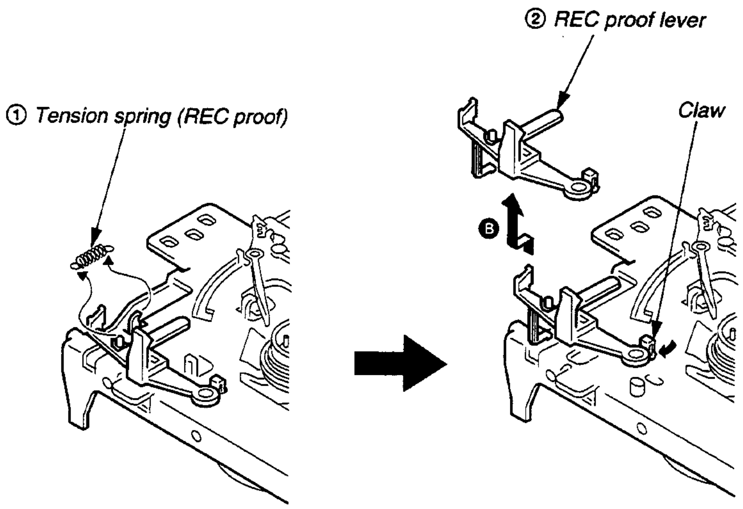

② REC proof lever
① Tension spring (REC proof)
Claw
🅑

Fig. 3-10

3-8. RVS BRAKE ARM ASSEMBLY

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove extension spring (RVS brake) ①.
3) Turn RVS brake arm assembly ② in the arrow 🅐 direction and remove it in the arrow 🅑.

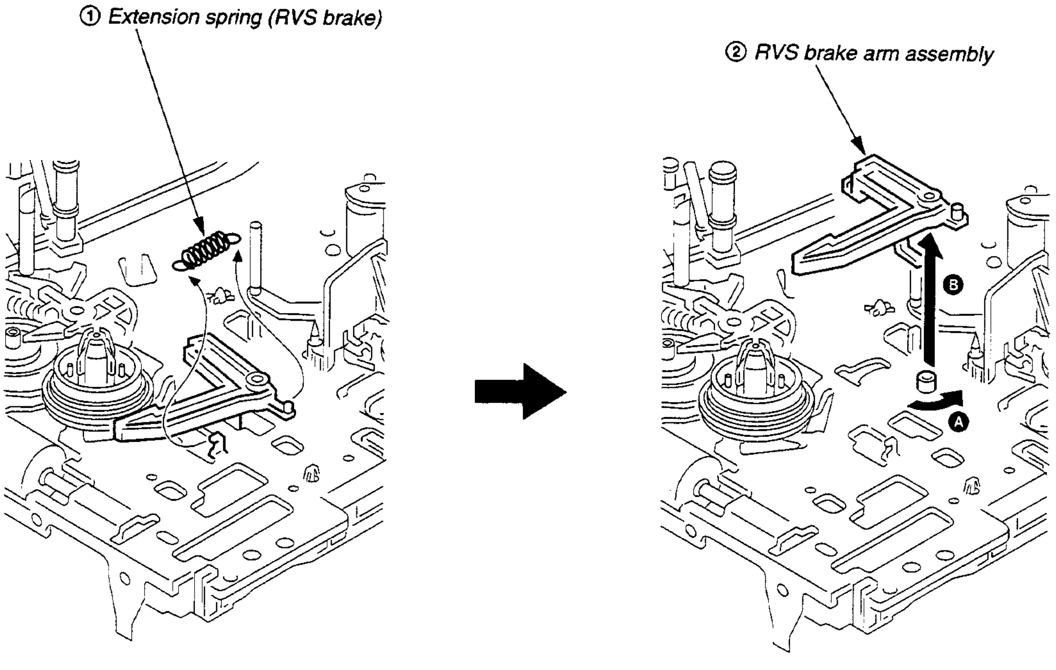

① Extension spring (RVS brake)
② RVS brake arm assembly
🅑
🅐

Fig. 3-11

3-9. MAIN (S) AND MAIN (T) BRAKE ASSEMBLIES

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove extension spring (main brake) ①.
3) Turn main (S) brake assembly ② in the arrow 🅐 direction and remove it in the arrow 🅑.
4) Turn main (T) brake assembly ③ in the arrow 🅒 direction and remove it in the arrow 🅓.

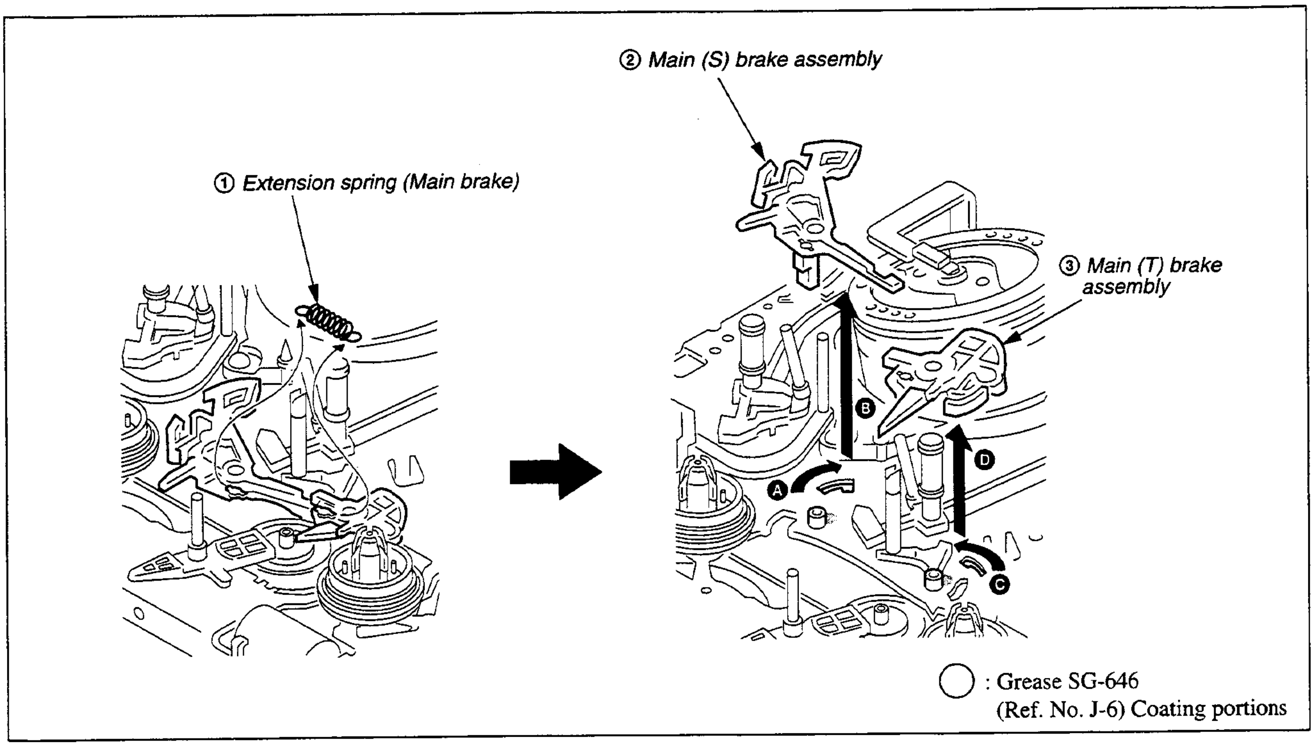

② Main (S) brake assembly
① Extension spring (Main brake)
③ Main (T) brake assembly
🅑
🅓
🅐
🅒
○ : Grease SG-646
(Ref. No. J-6) Coating portions

Fig. 3-12

3-10. REEL (T) TABLE (BLACK)

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove stopper washer ① to pull reel (T) table ② out.
3) Remove thrust washer ③.

[Note on Mounting]

- Before attaching, confirm the oil is applied at the top of reel (T) shaft.

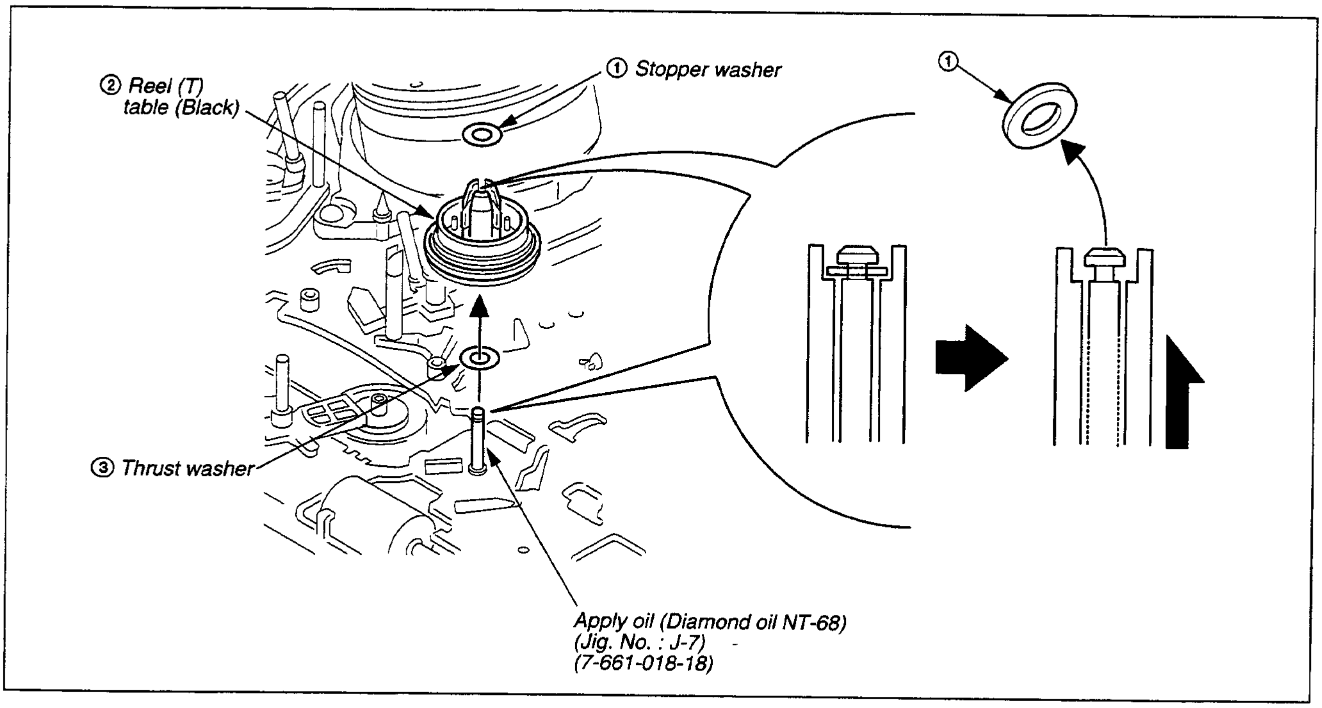

② Reel (T) table (Black)
① Stopper washer
①
③ Thrust washer
Apply oil (Diamond oil NT-68)
(Jig. No. : J-7)
(7-661-018-18)

Fig. 3-13

3-11. PENDULUM ARM ASSEMBLY

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove main (S) and main (T) brake assemblies. (Refer to 3-9.)
3) While releasing claws from the pendulum arm shaft in the arrow A direction, pull out pendulum arm assembly ①.

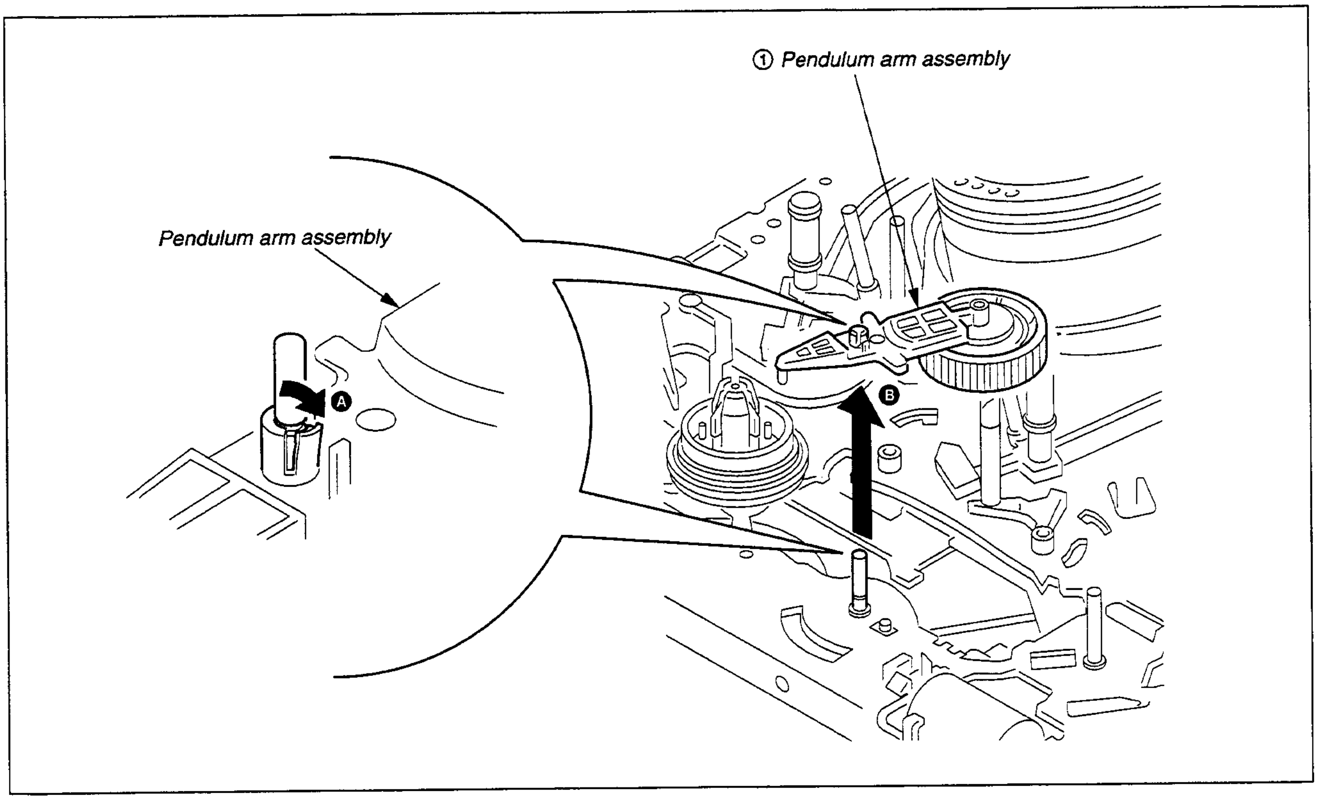

① Pendulum arm assembly
Pendulum arm assembly
A
B

Fig. 3-14

3-12. FL SLIDER BLOCK ASSEMBLY

1) Remove FL complete assembly. (Refer to 3-1.)
2) Set the mechanism deck upside down.
3) Remove a screw (BVTP 3 × 8) ① and then retainer plate ② is getting out of place.
4) Slide FL slider block assembly ③ off in the arrow Ⓐ direction and raise it up.

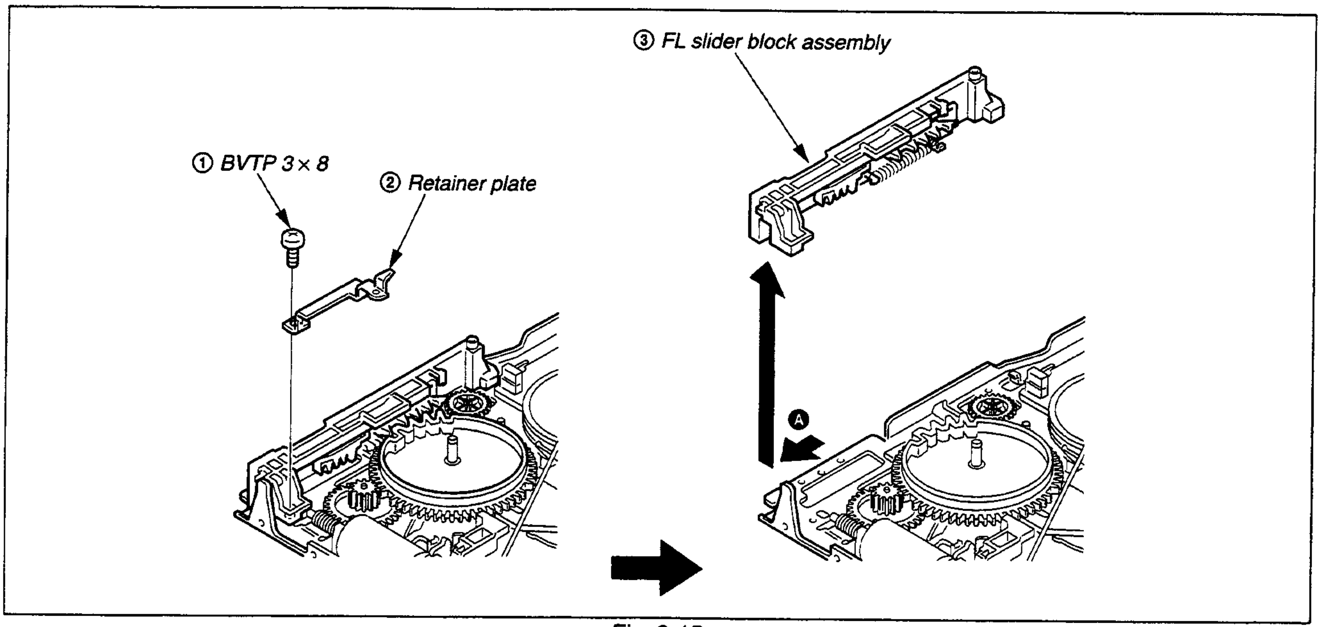
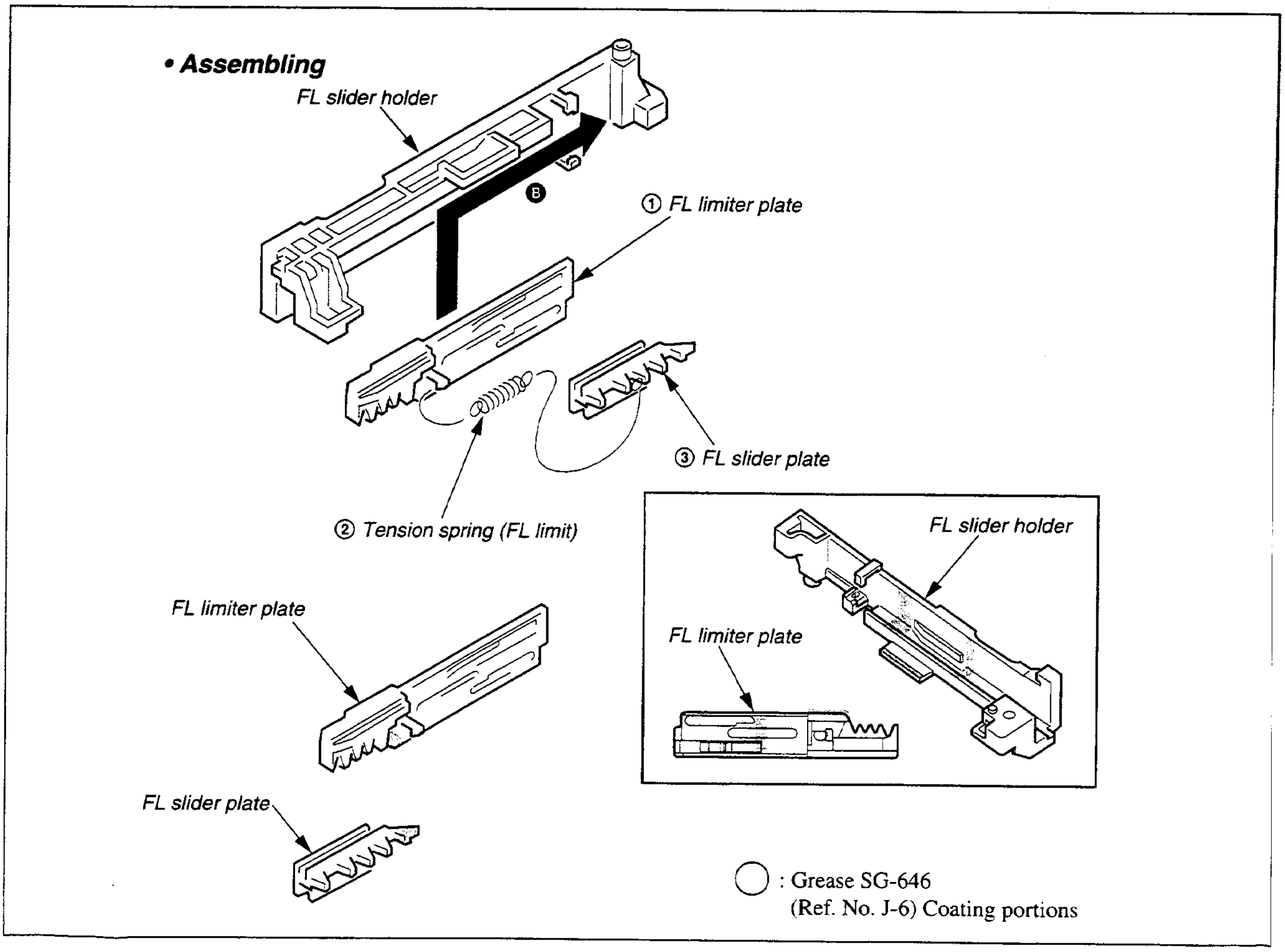

③ FL slider block assembly
① BVTP 3 × 8
② Retainer plate
Ⓐ

Fig. 3-15


• Assembling
FL slider holder
Ⓑ
① FL limiter plate
③ FL slider plate
② Tension spring (FL limit)
FL limiter plate
FL slider holder
FL limiter plate
FL slider plate

○ : Grease SG-646
(Ref. No. J-6) Coating portions

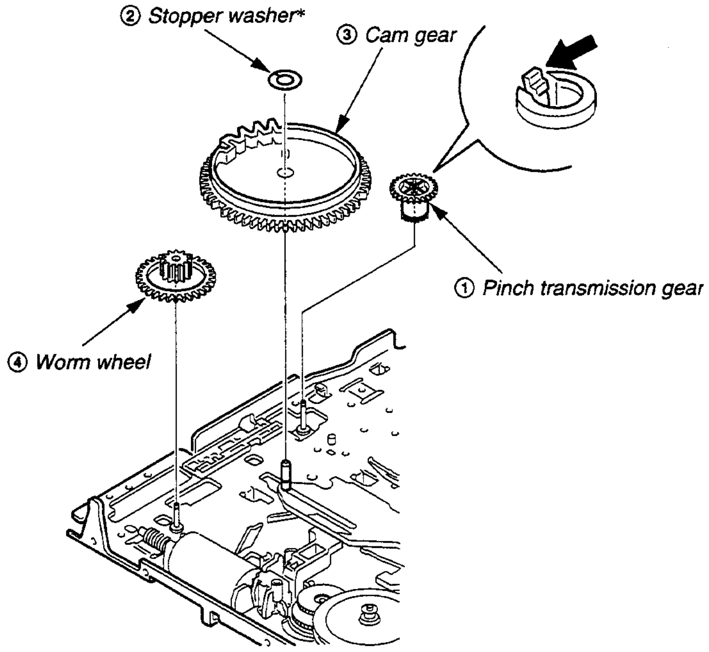
Fig. 3-16

3-13. PINCH TRANSMISSION GEAR, CAM GEAR, WORM WHEEL

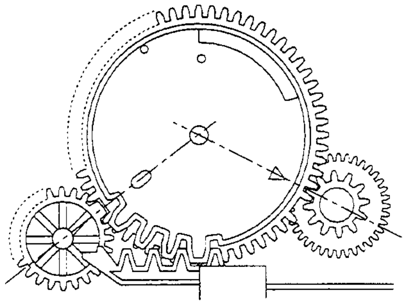
1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove FL slider block assembly. (Refer to 3-12.)
3) Remove pinch transmission gear ① by putting off its claw from shaft.
4) Remove stopper washer ②* to pull out cam gear ③.
5) Remove worm wheel ③ by putting off its claw from shaft.

[Note on Mounting]

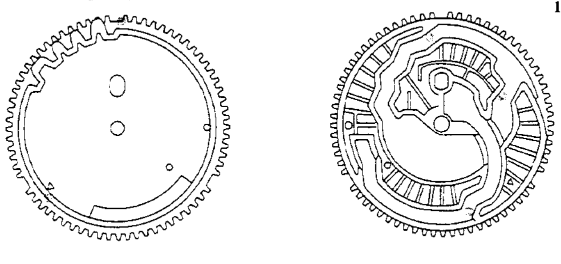
- Before attaching cam gear ③, confirm that the specified locations are coated with grease SG-646 (Ref. No. J-6).
- Adjust the phase of gears each other.



• Phase adjustment



○ : Grease SG-646
(Ref. No. J-6) Coating portions



[Top] *[Bottom]*

* Once remove stopper washer ②, don't use it again. Replace it with new one.

Fig. 3-17

3-14. CAPSTAN BRAKE ASSEMBLY, CAPSTAN BRAKE SHAFT

1) Remove rubber belt. (Refer to 3-4.)
2) Remove cap brake spring ①.
3) Remove capstan brake assembly ② by putting off claw of capstan brake shaft ③.
4) Set the mechanical chassis bottom side down.
5) While pushing the boss of capstan brake shaft ③, turn it clockwise to remove it.

[Note on Mounting]

- Don't touch shoe of capstan brake assembly with bare hand.

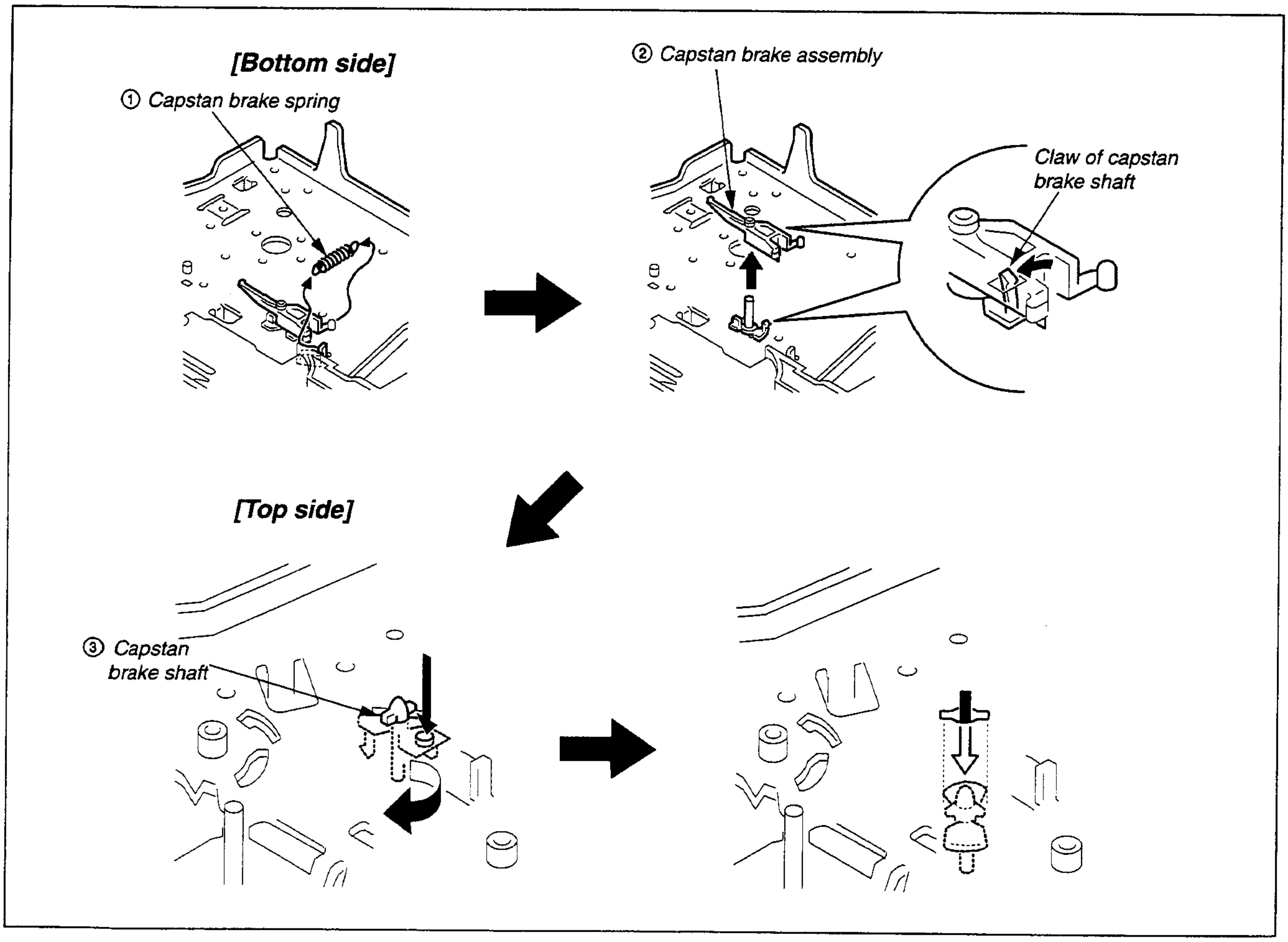

[Bottom side]
① Capstan brake spring
② Capstan brake assembly
Claw of capstan brake shaft
[Top side]
③ Capstan brake shaft

Fig. 3-18

3-15. FL SLIDER GUIDE

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove FL slider block assembly. (Refer to 3-12.)
3) Remove FL slider guide ① while pushing claws in the arrow Ⓐ direction.

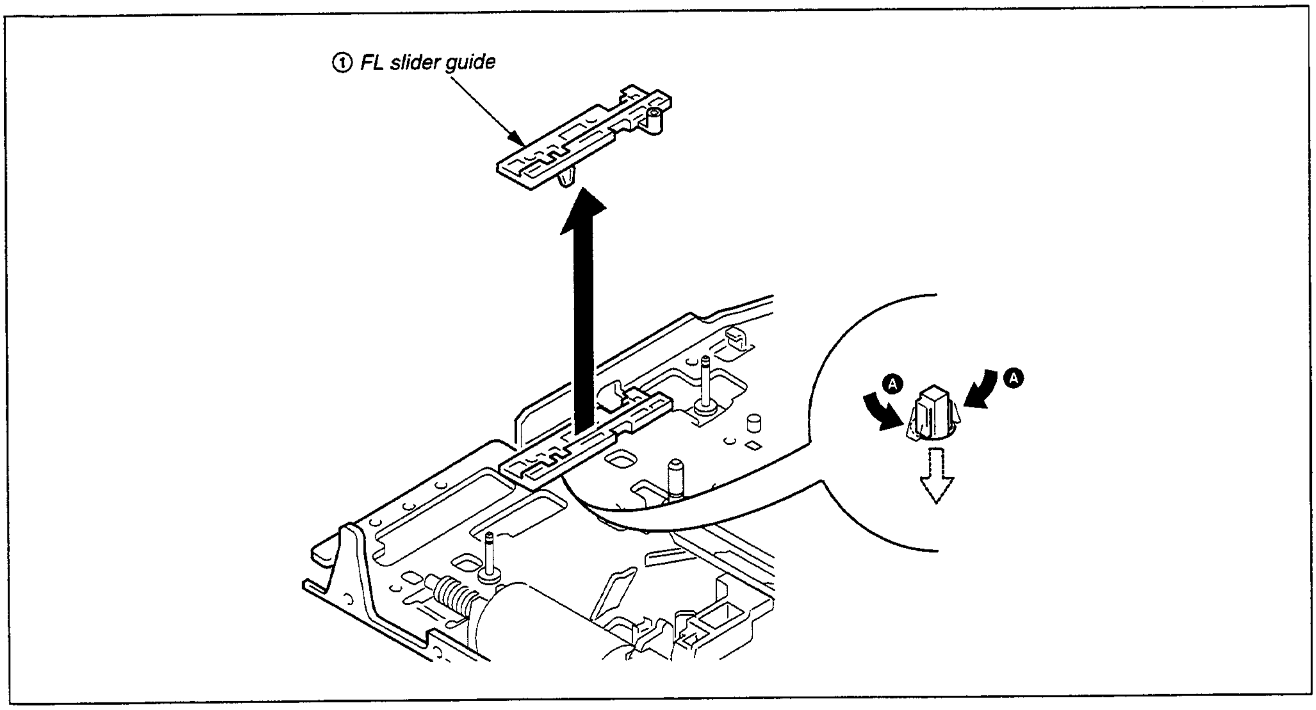


Fig. 3-19

3-16. SLIDER

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove rubber belt. (Refer to 3-4.)
3) Remove FL slider block assembly. (Refer to 3-12.)
4) Remove cam gear. (Refer to 3-13.)
5) Remove stopper washers ① and remove slider ② in the arrow direction.

[Note on Mounting]

- Before attaching slider ②, confirm the specified locations are coated with grease SG-646 (Ref. No. J-6).
- When attaching slider ②, adjust "Δ" mark on slider to loading gear (T) shaft as shown in Fig. A.

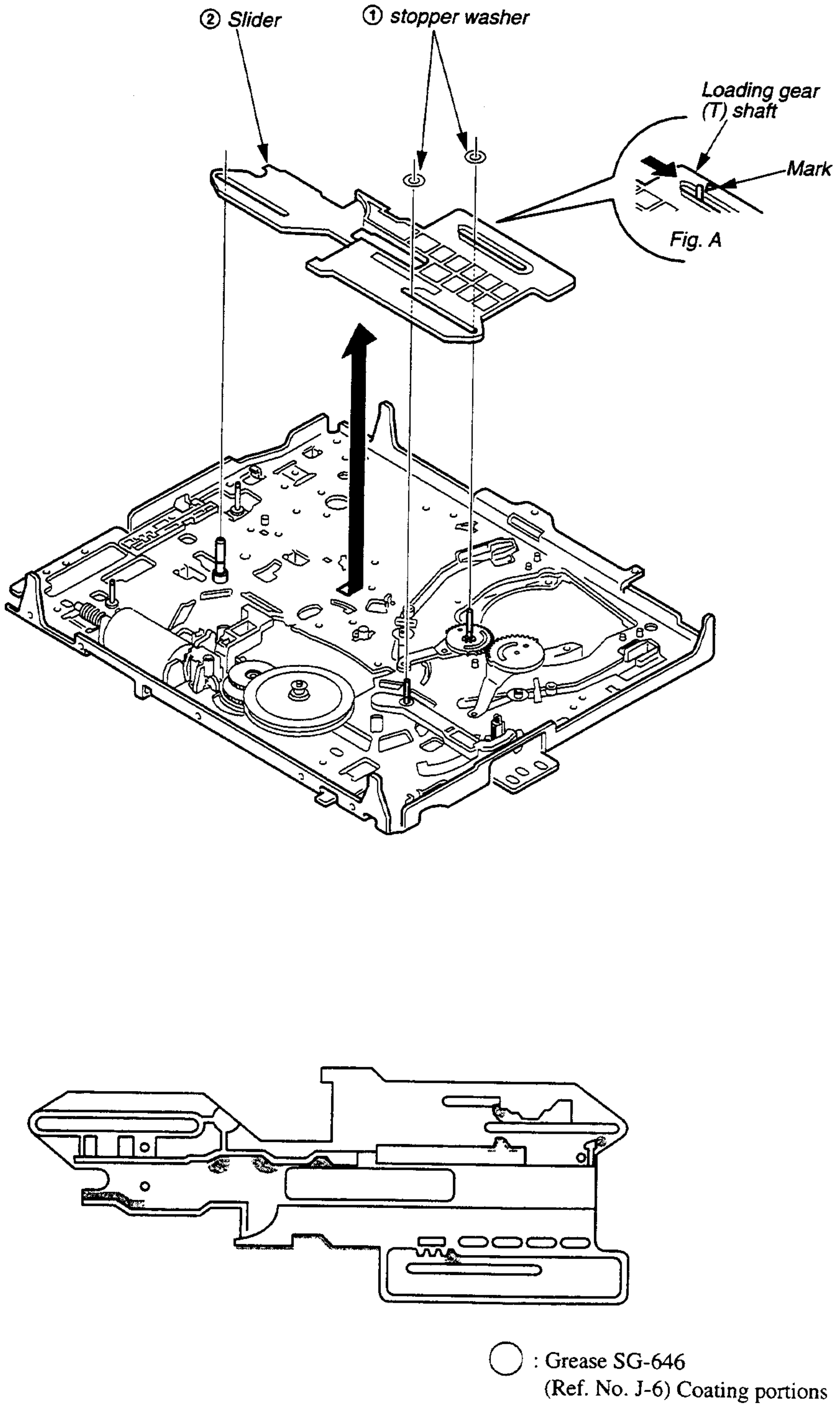

② Slider
① stopper washer
Loading gear (T) shaft
Mark
Fig. A
○ : Grease SG-646 (Ref. No. J-6) Coating portions

Fig. 3-20

3-17. TG1 DRIVING ARM

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove rubber belt. (Refer to 3-4.)
3) Remove FL slider block assembly. (Refer to 3-12.)
4) Remove cam gear. (Refer to 3-13.)
5) Remove slider. (Refer to 3-16.)
6) Remove spring (power tension) ① from TG1 driving arm ②.
7) Remove TG1 driving arm ② by turning it in the arrow 🅐 to 🅑 direction.

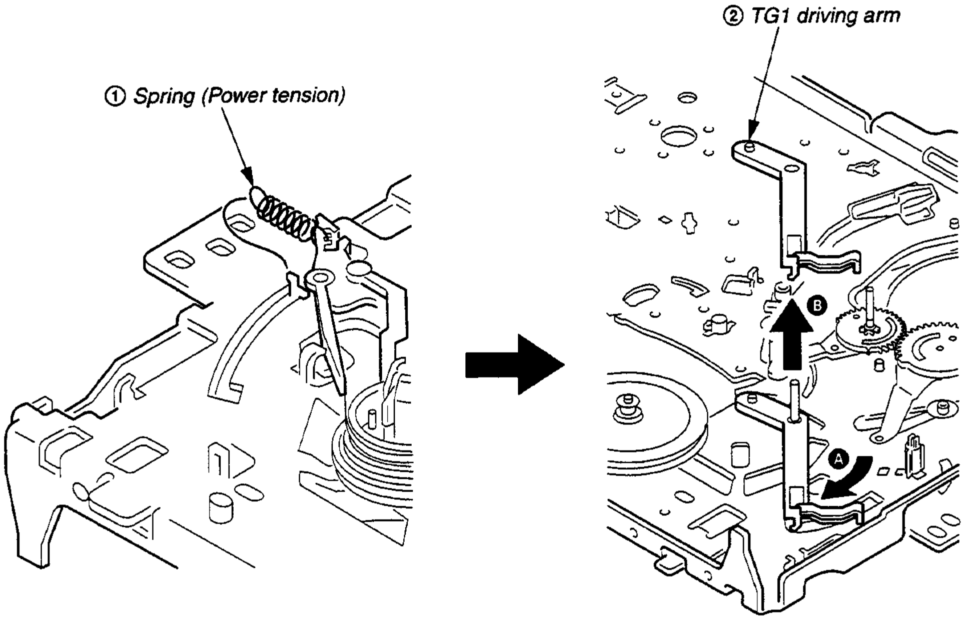

② TG1 driving arm
① Spring (Power tension)
🅑
🅐

Fig. 3-21

3-18. LOADING (T) AND LOADING (S) GEAR ASSEMBLIES

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove rubber belt. (Refer to 3-4.)
3) Remove FL slider block assembly. (Refer to 3-12.)
4) Remove cam gear. (Refer to 3-13.)
5) Remove slider. (Refer to 3-16.)
6) Remove loading (T) gear assembly ① and loading (S) gear assembly ② in the arrow direction.

[Note on Mounting]

- When attaching them, be sure to adjust the phase each other.

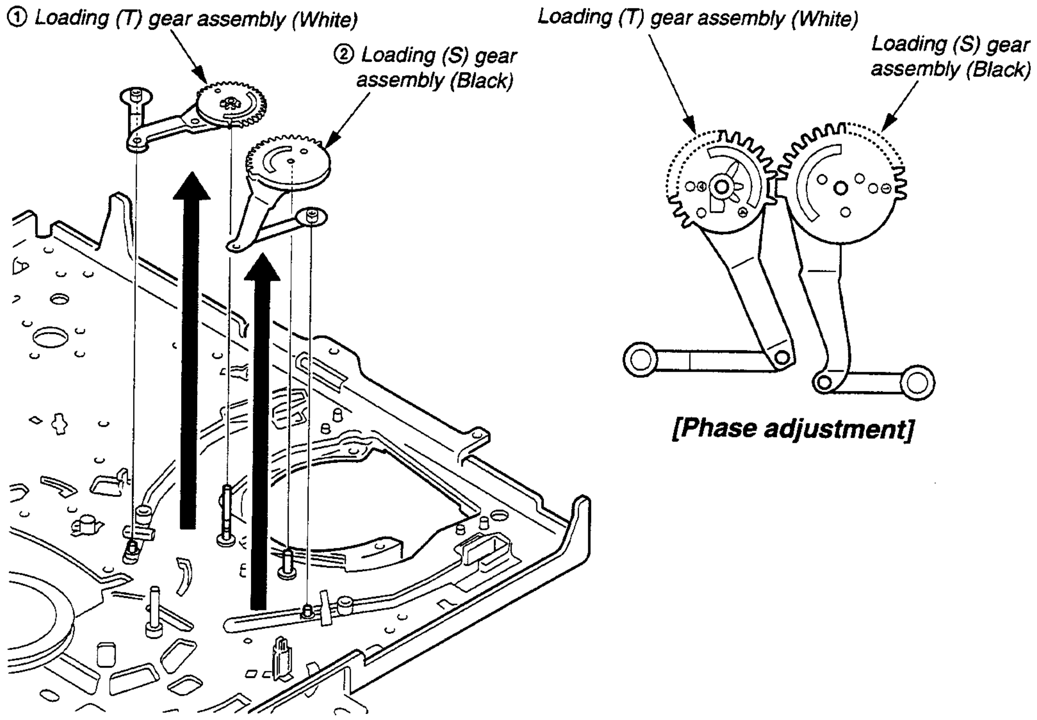

① Loading (T) gear assembly (White)
② Loading (S) gear assembly (Black)
Loading (T) gear assembly (White)
Loading (S) gear assembly (Black)
[Phase adjustment]

Fig. 3-22

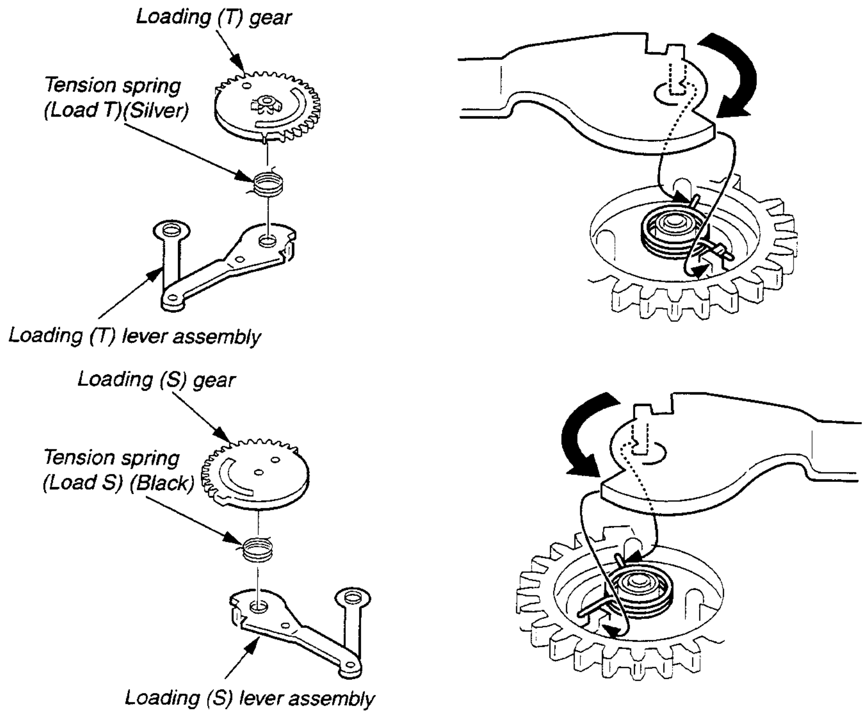

Loading (T) gear
Tension spring (Load T)(Silver)
Loading (T) lever assembly
Loading (S) gear
Tension spring (Load S) (Black)
Loading (S) lever assembly

Fig. 3-23

3-19. PULLEY GEAR ASSEMBLY, CLUTCH GEAR

1) Remove rubber belt. (Refer to 3-4.)
2) Remove stopper washer ①.
3) Remove pulley gear assembly ② with clutch gear ③.

[Note on Mounting]

- When attaching them, don't insert strongly.

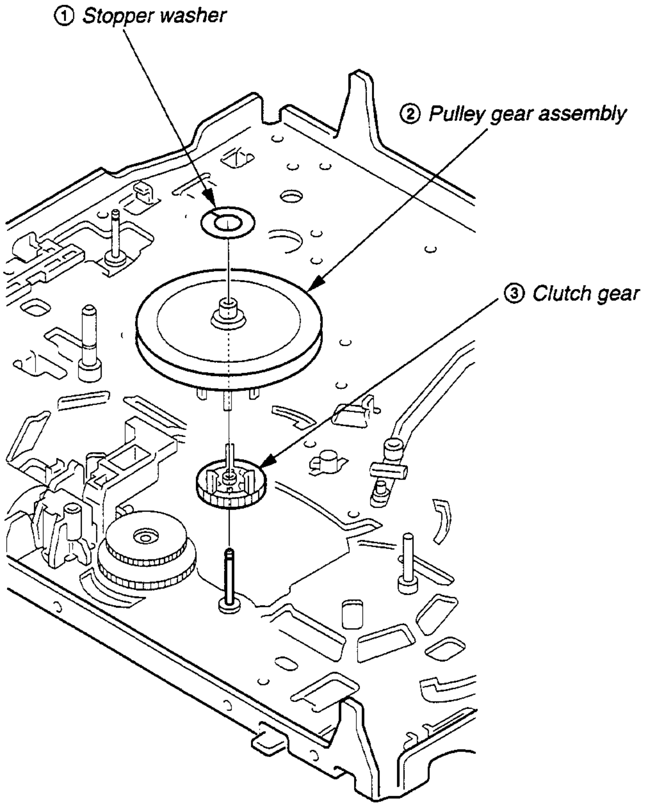

① Stopper washer
② Pulley gear assembly
③ Clutch gear

Fig. 3-24

3-20. REEL DIRECT ASSEMBLY

1) Remove rubber belt. (Refer to 3-5.)
2) Remove pulley gear assembly with clutch gear. (Refer to 3-19.)
3) Remove stopper washer ① and reel direct assembly ②.

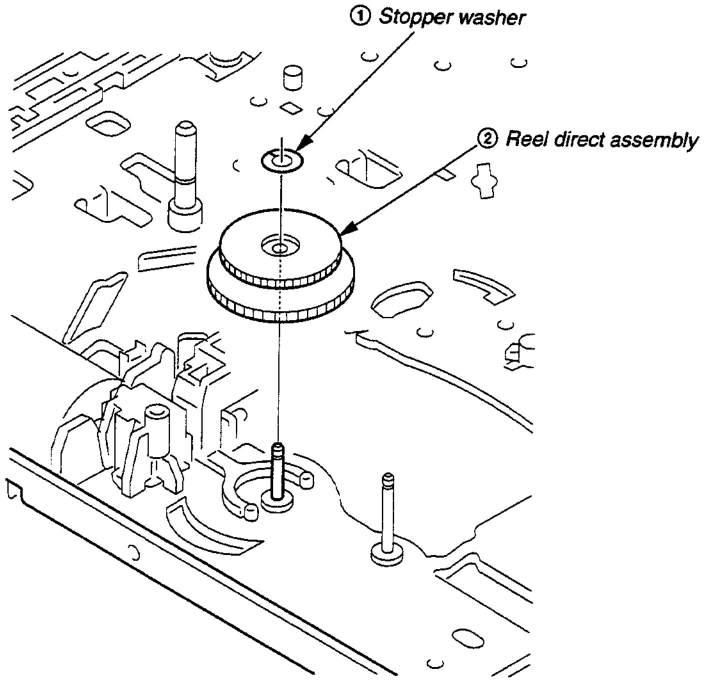

① Stopper washer
② Reel direct assembly

Fig. 3-25

3-21. CASSETTE GUIDE PLATE

1) Remove a screw (P 3 × 8) ① and remove cassette guide plate ②.

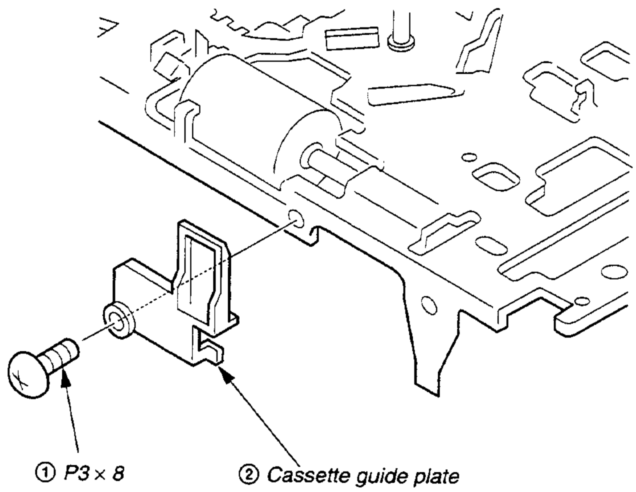

① P3 × 8
② Cassette guide plate

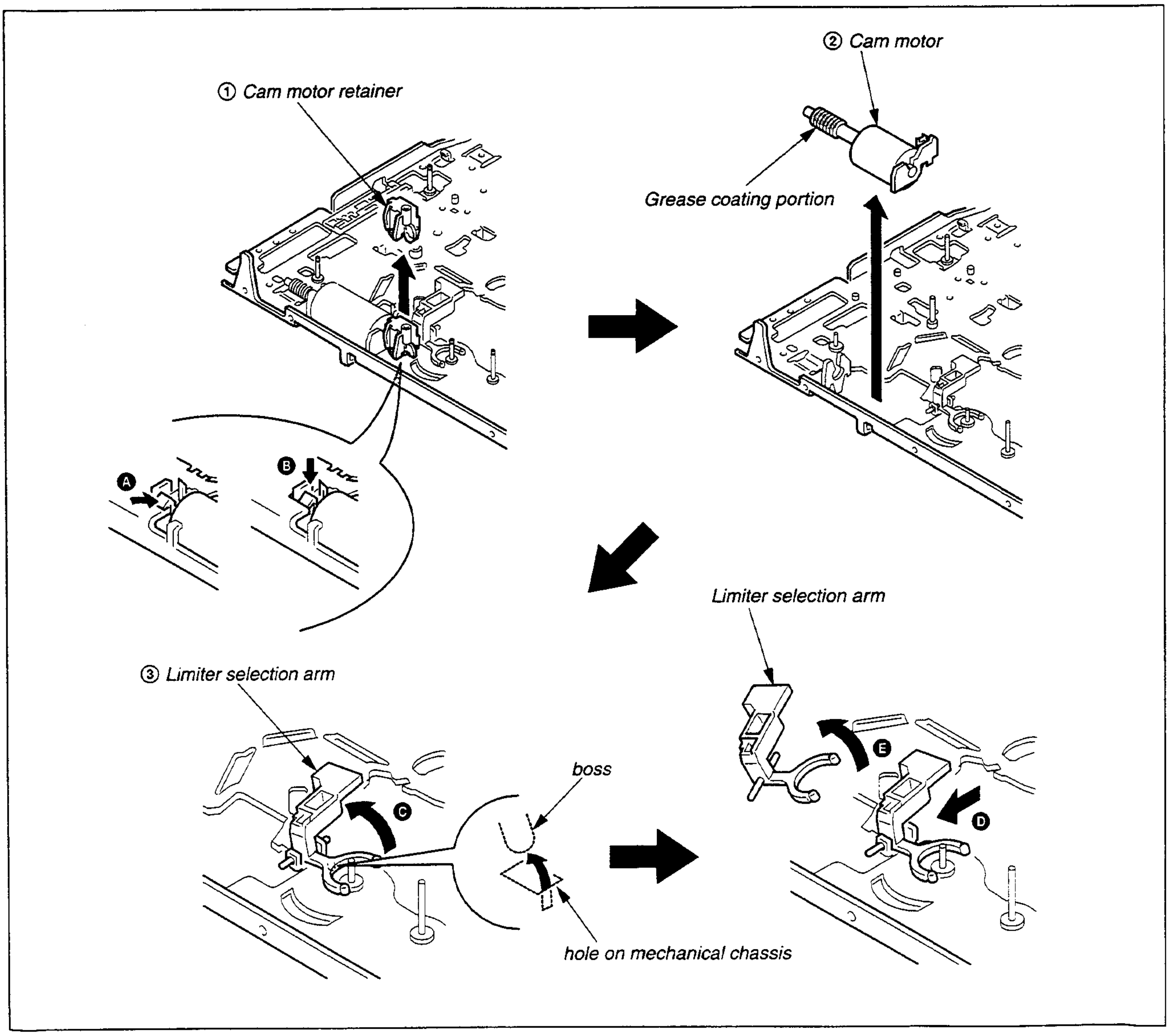
Fig. 3-26

3-22. CAM MOTOR ASSEMBLY, LIMITER SELECTION ARM

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove rubber belt. (Refer to 3-4.)
3) Remove FL slider block assembly. (Refer to 3-12.)
4) Remove worm wheel. (Refer to 3-13.)
5) Remove pulley gear assembly with clutch gear. (Refer to 3-19.)
6) Remove and reel direct assembly. (Refer to 3-20.)
7) Remove cam motor retainer ① in the arrow 🅑 while pushing its claw in the arrow 🅐 direction.
8) Then cam motor assembly ② is out of place.
9) Remove the boss of limiter selection arm ③ from the hole on the mechanical chassis by pushing in the arrow 🅒 direction and push it in the arrow 🅓 direction and remove it in the arrow 🅔 direction.

[Note on Mounting]

- Before attaching cam motor assembly ②, confirm the specified locations are coated with grease SG-646 (Ref. No. J-6).



② Cam motor
① Cam motor retainer
Grease coating portion
🅐
🅑
Limiter selection arm
③ Limiter selection arm
boss
🅒
🅔
🅓
hole on mechanical chassis

Fig. 3-27

3-23. DRUM BASE, HC ROLLER BLOCK ASSEMBLY

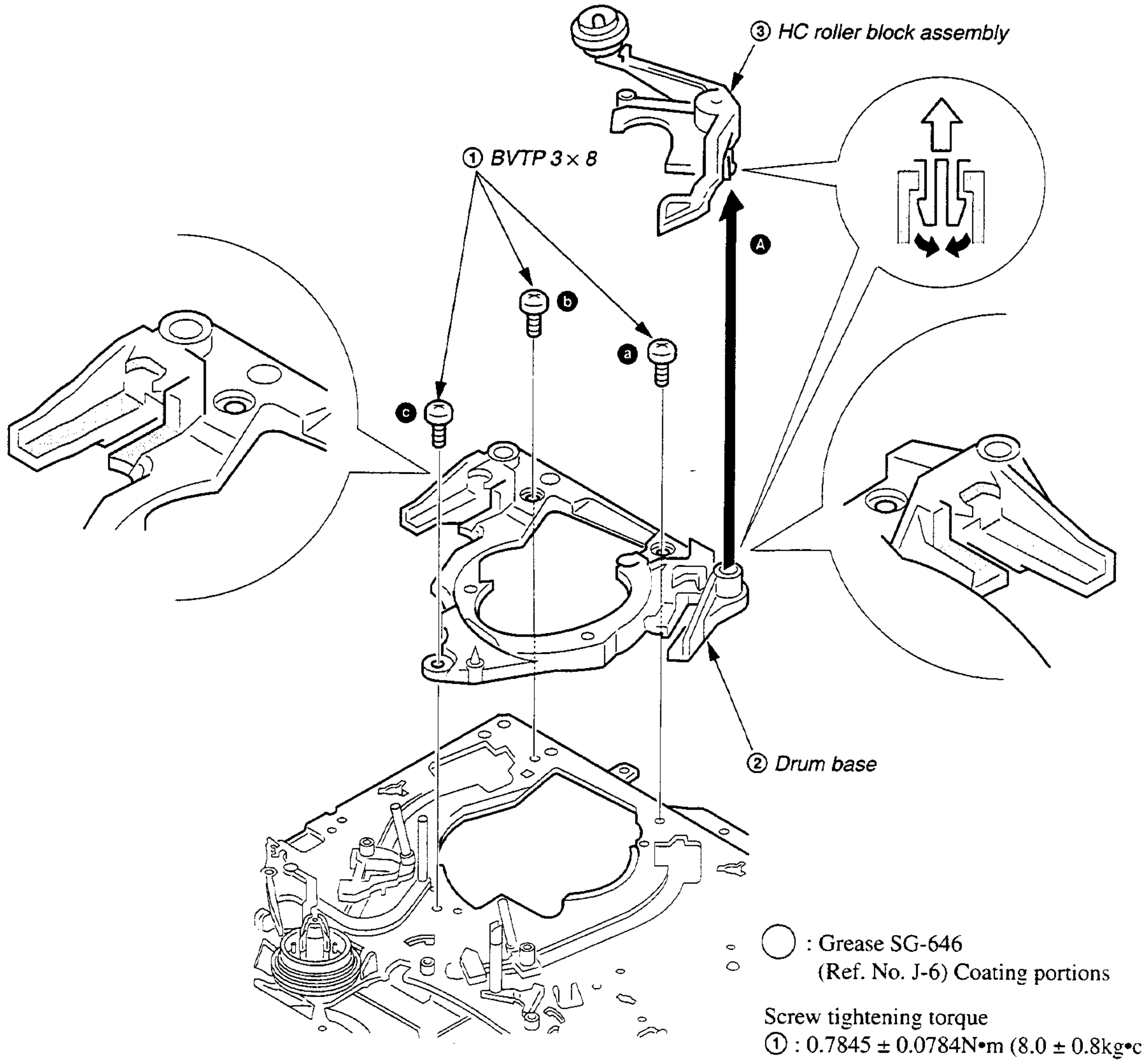
1) Remove the drum assembly. (Refer to 3-2.)
2) Remove screws BVTP 3 × 8 ①.
3) Remove drum base ②.
4) Pull out HC roller assembly ③ straight in the arrow Ⓐ direction.

[Note on Mounting]

- Before attaching drum base ②, confirm the specified locations are coated with grease SG-646 (Ref. No. J-6).
- Tightening screws ① in the order ⓐ to ⓑ to ⓒ.

[Adjustment after Mounting]

- 4-1. Tape path adjustment



○ : Grease SG-646
(Ref. No. J-6) Coating portions

Screw tightening torque
① : 0.7845 ± 0.0784N•m (8.0 ± 0.8kg•cm)

Fig. 3-28

3-24. SHUTTLE (S) AND SHUTTLE (T) BLOCK ASSEMBLIES

1. Guide Roller Assemblies

1) Turn them counterclockwise, then they are out of place, also springs.

[Note on Mounting]

Don't touch the surface that contacts tape with bare hand.

[Adjustment after Mounting]

- 4-1. Tape path adjustment

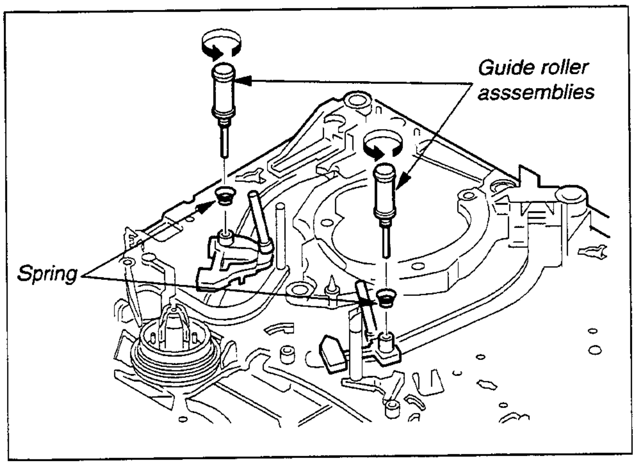

Guide roller
asssemblies
Spring

Fig. 3-29

2. Shuttle (S) and Shuttle (T) Assemblies

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove the drum assembly. (Refer to 3-2.)
3) Remove rubber belt. (Refer to 3-4.)
4) Remove FL slider block assembly. (Refer to 3-12.)
5) Remove cam gear. (Refer to 3-13.)
6) Remove slider. (Refer to 3-16.)
7) Remove loading (T) gear assembly and loading (S) gear assembly. (Refer to 3-18.)
8) Remove drum base. (Refer to 3-23.)
9) Remove shuttle (S) or shuttle (T) assembly by slide them backward.

[Note on Mounting]

Don't touch the surface that contacts tape with bare hand.

[Adjustment after Mounting]

- 4-1. Tape path adjustment

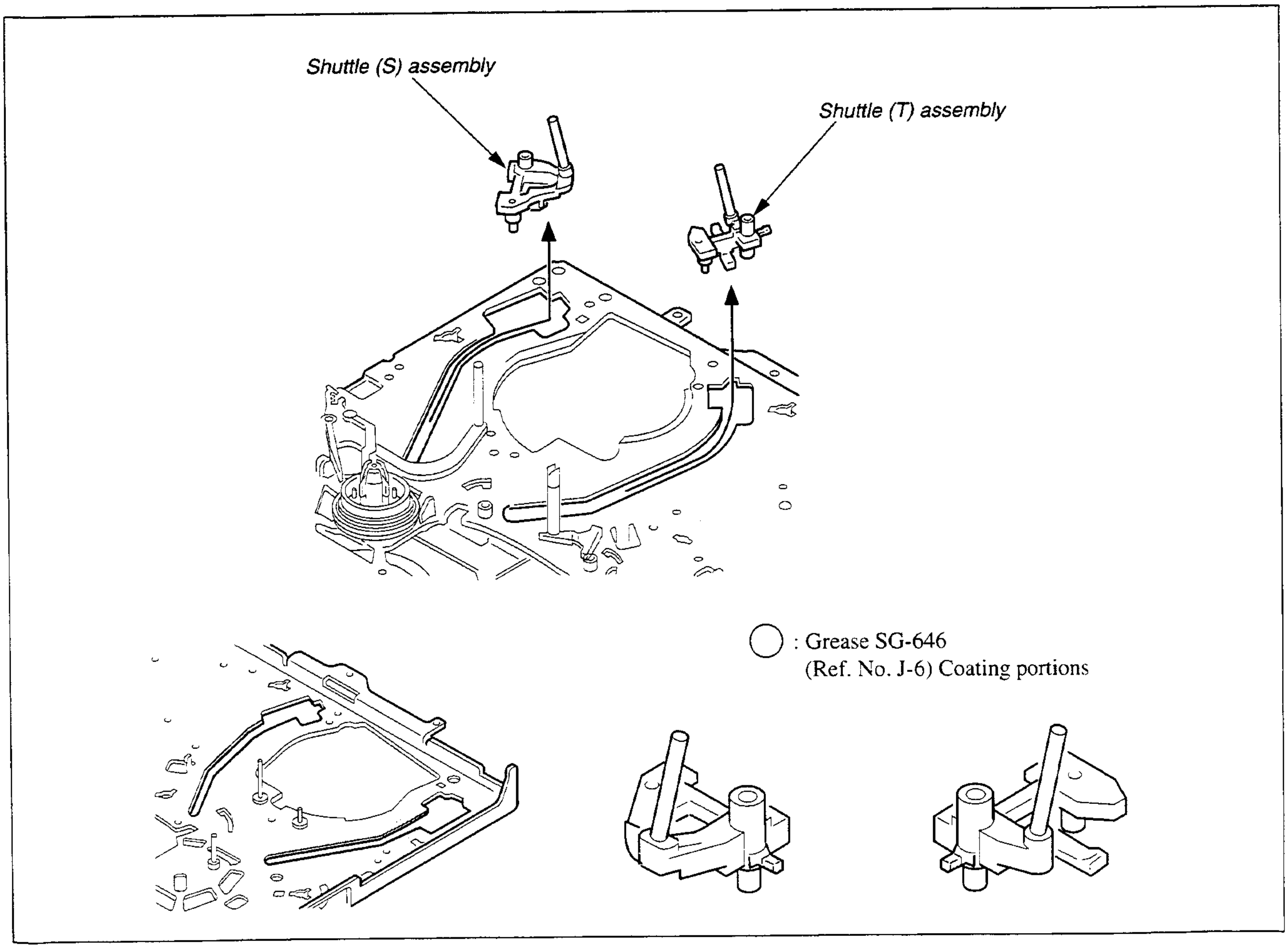

Shuttle (S) assembly
Shuttle (T) assembly
○ : Grease SG-646
(Ref. No. J-6) Coating portions

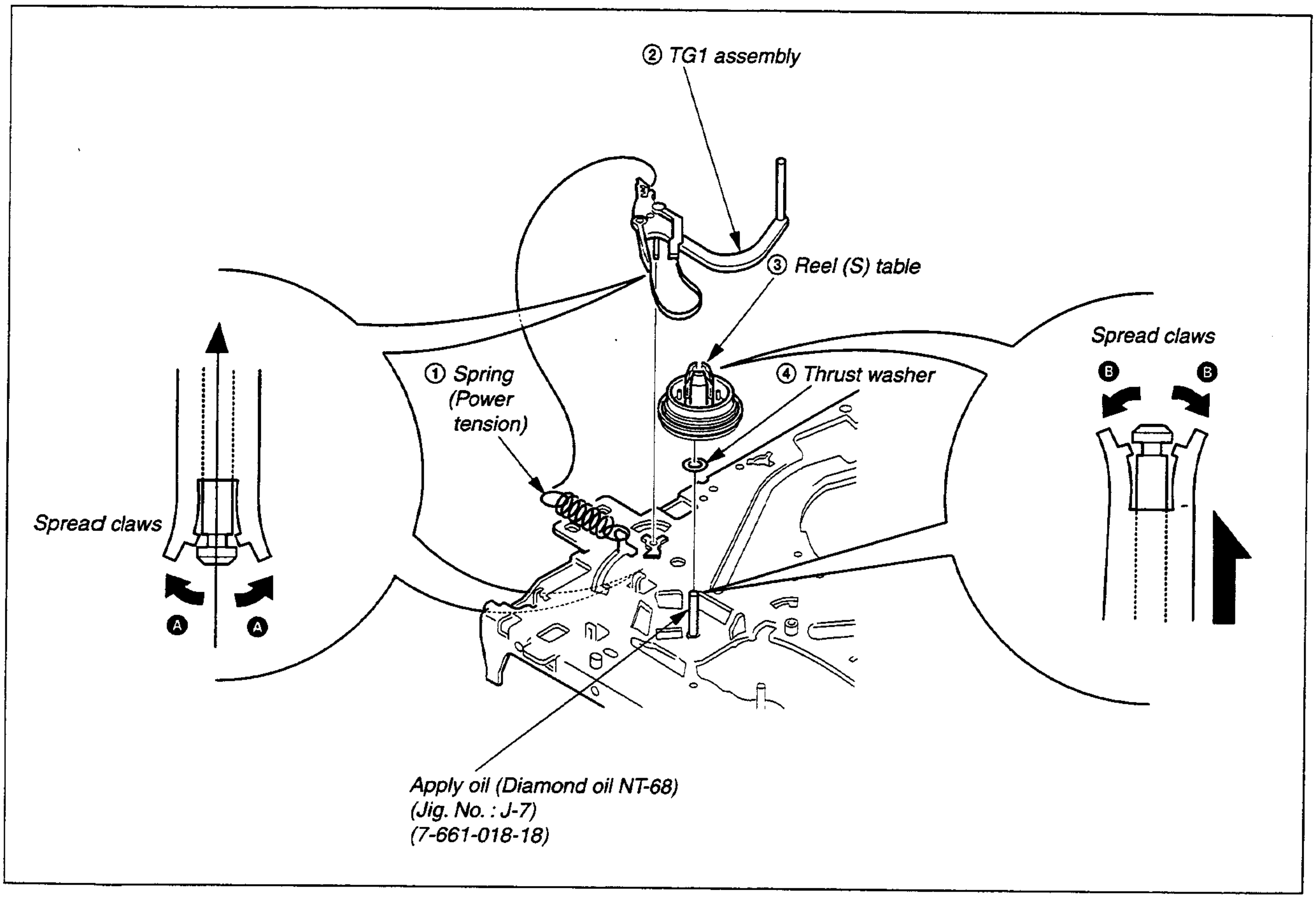
Fig. 3-30

3-25. TG1 ASSEMBLY, REEL (S) TABLE

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove spring (power tension) ① from TG1 driving arm.
3) While spreading claws on the bottom in the arrows Ⓐ direction, pull TG1 assembly ② out.
4) While spreading claws on the top in the arrows Ⓑ direction, pull reel (S) table ③ out.
5) Remove thrust washer ④.

[Note on Mounting]
Don't touch the surface that contacts tape and the braking surface of TG1 assembly with bare hand.

[Adjustment after Mounting]
- 4-1. Tape path adjustment



② TG1 assembly
③ Reel (S) table
① Spring (Power tension)
④ Thrust washer
Spread claws
Ⓐ Ⓐ
Spread claws
Ⓑ Ⓑ
Apply oil (Diamond oil NT-68)
(Jig. No. : J-7)
(7-661-018-18)

Fig. 3-31

3-26. TG1 FULCRUM BOSS

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove TG1 assembly. (Refer to 3-25.)
3) Turn TG1 fulcrum boss counterclockwise and pull it out.

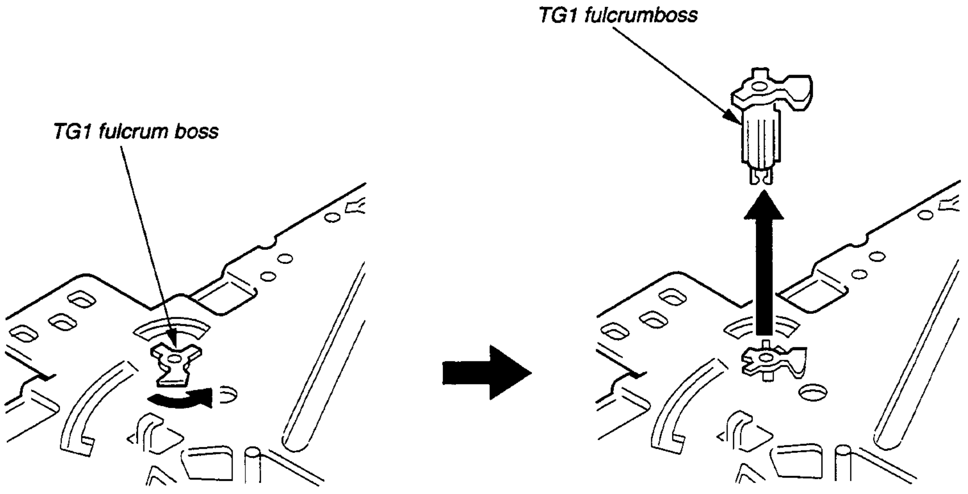

TG1 fulcrumboss
TG1 fulcrum boss

Fig. 3-32

3-27. LUMINOUS PLATE

1) Remove main (T) brake assembly. (Refer to 3-9.)
2) Turn luminous plate clockwise while raising a portion Ⓐ slightly and pull out it.

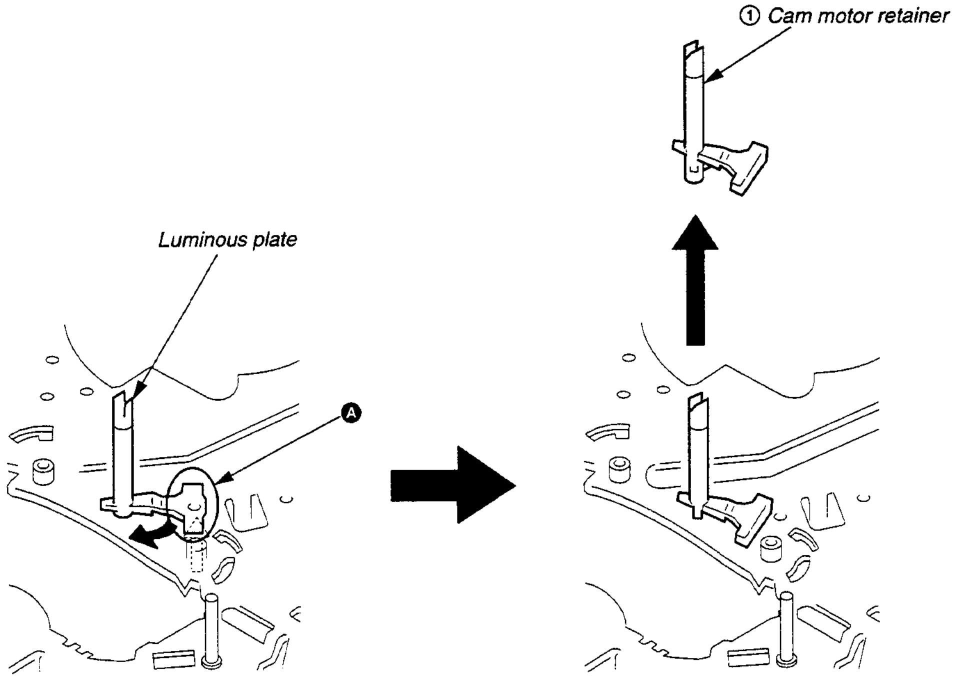

① Cam motor retainer
Luminous plate
Ⓐ

Fig. 3-33

4. ADJUSTMENT

4-1. TAPE PATH ADJUSTMENT

The "Tape path" refers to the route of the tape from the supply reel disk to the take-up reel disc via the video heads.

Each component part of the tape transport system particularly the surface of parts which make direct contact with the tape must always be kept clean, free of dust, oil, scratches and so forth.

The tape path system is factory pre-adjusted, when parts of the tape transport system are replaced, be sure to make the required adjustments as precisely as possible in order to ensure stable tape transport.

4-1-1. TENSION REGULATOR (TG1) POSITION/ TENSION ADJUSTMENT (Fig. 4-1)

Purpose: stabilizes contact of the video head and the tape to maintain the tension of the tape so that it feeds at a constant level.

• Position adjustment

Mode	Threading is completed without a cassette loaded (Playback)
Adjustment locations	Eccentric pin of TG1 band assembly

[Adjustment Method]

1) Allow the unit to go through the threading procedure without a cassette loaded.
2) Set the unit to play back, then turn the eccentric pin so that the tip of tension arm goes to the left side line carved on the mechanical chassis. (Fig. A)
3) After adjustment, go through the loading procedure once more without a cassette loaded, then check the position of the tension arm.

• Tension adjustment

Mode	Playback (SP)
Measuring instrument/tool	Torque cassette VHT-103S (Ref. No. J-1)
Adjustment locations	Position for hooking the tension spring
Specified value	5.05 to 6.52 mN•m (51.5 to 66.5g•cm) (without TC assembly) 3.78 to 5.10 mN•m (38.5 to 52.0g•cm) (with TC assembly)

[Adjustment Method]

1) Playback the torque cassette.
2) Check that the center value deviation reading on the torque cassette meets with the standards.
3) When the reading is higher than the standards : Move the spring toward direction Ⓐ.
   When the reading is less than the standards : Move the spring toward direction Ⓑ.

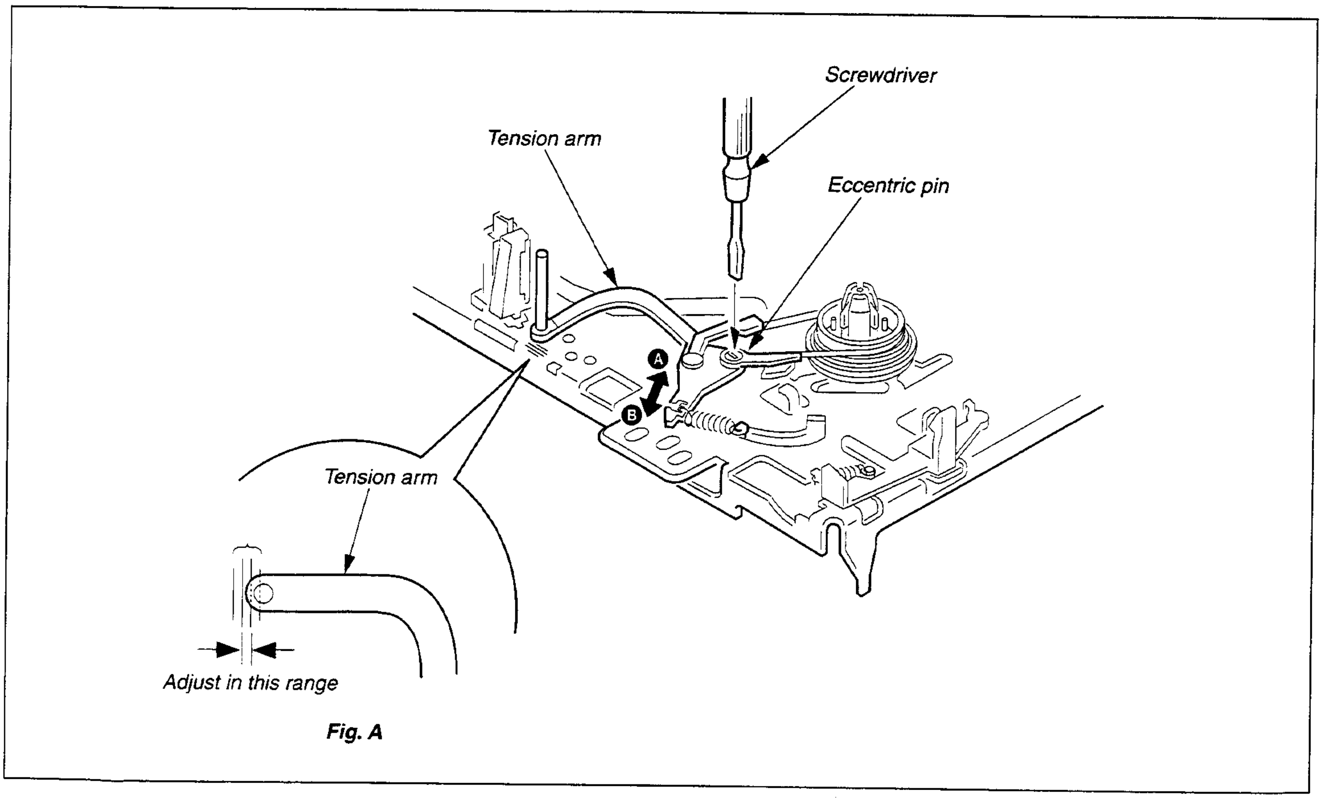


Fig. 4-1

4-1-2. CHECKING THE TENSION AND TORQUE

Purpose : To check that the tension, torque and compression force of the tape take-up section and mobile sections to ensure smooth tape run and achieve standard VTR performance.
If the tape transport is not smooth or problems occur in relation to the tape transport speed, perform the following check.

Mode	Each operation mode
Measuring instrument	Torque cassette VHT-103S, VHT-404S

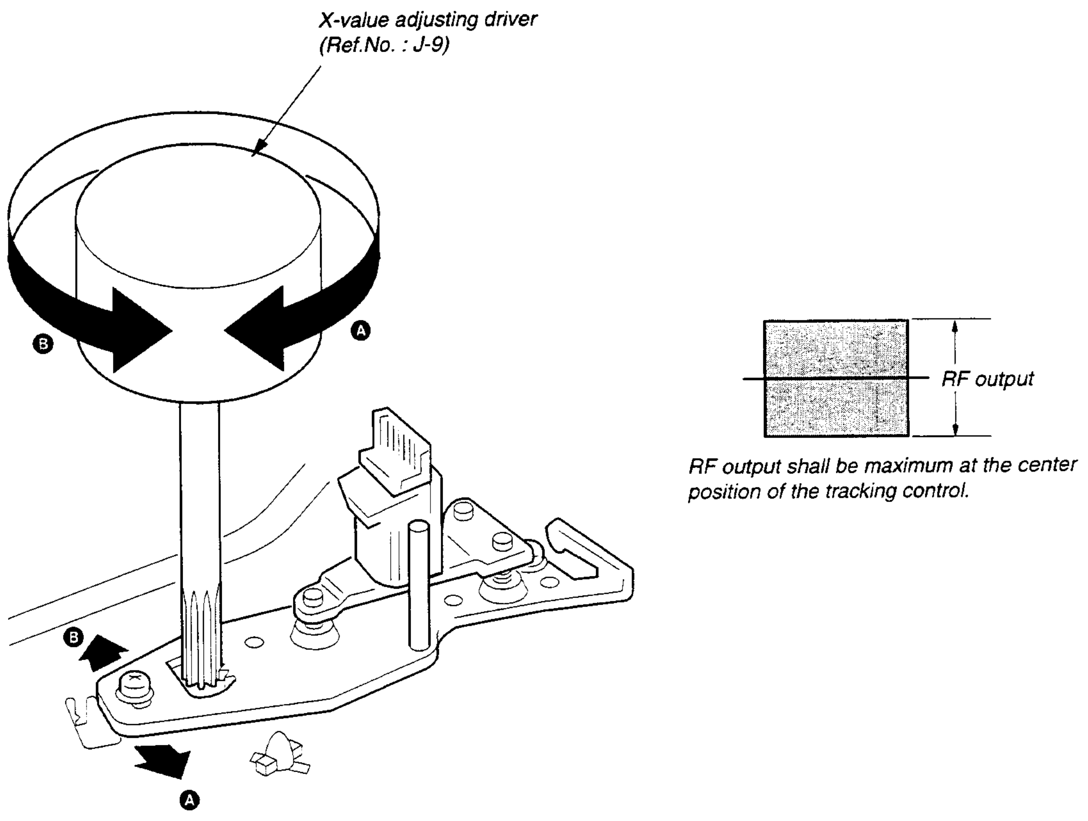
Item	VTR operation mode	Reel to be measured	Measurement value
Review torque	Review	S reel	12.7 to 19.6 mN•m (130 to 200 g•cm)
Take-up torque	Playback	T reel	4.41 to 10.8 mN•m (45 to 110g•cm)
Back tension torque	Playback	S reel	See section 4-1-1.

4-1-3. X-VALUE ADJUSTMENT (Using the tape having the version No.)

Purpose: To obtain compatibility with other VCRs.

Precaution: Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

Mode	Playback
Signal	Alignment tape: KRV-52NE (NTSC)/ 52PL(PAL)
Measuring instrument	Oscilloscope TIME/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH1: Connector PB RF pin for RF PC board check CH2: Connector RF SWP pin for RF PC board check
Adjustment locations	ACE base assembly



RF output shall be maximum at the center position of the tracking control.

Fig. 4-2

[Adjustment Method]

Set the tracking control at the center position. For the VCRs equipped with standard gap video heads, set the ACE head position with X-value adjusting driver where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the ACE head position with X-value adjusting driver both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.

* TYPE OF DRUM

DZH-68D
DZH-71D
DZH-77A
DZH-78A
DZH-78B
DZH-89A
DZH-90A
DZH-91A
DZH-92A

1. Adjusting X-value (Using the tape having the version No.)

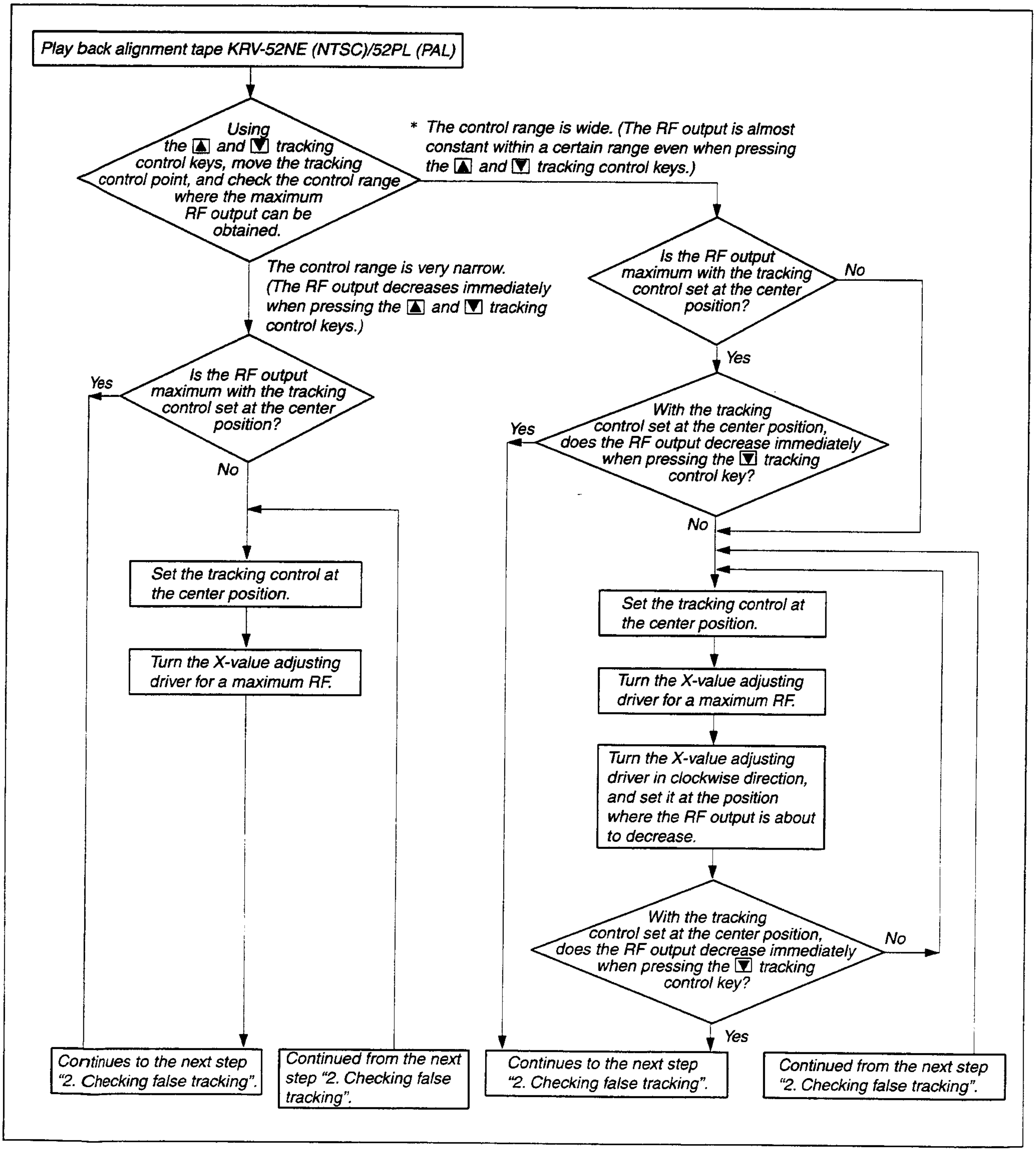
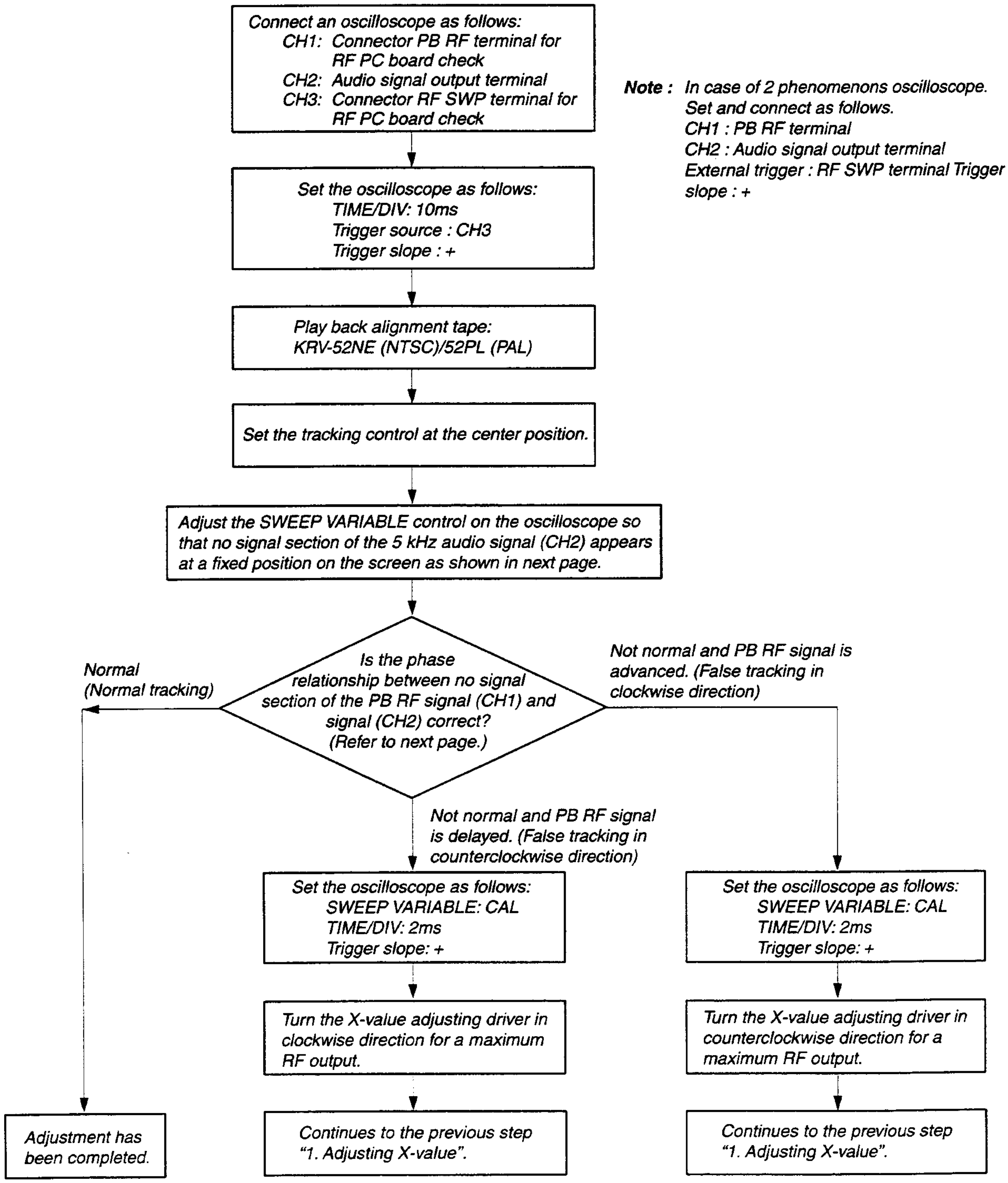

Play back alignment tape KRV-52NE (NTSC)/52PL (PAL)
Using the ▲ and ▼ tracking control keys, move the tracking control point, and check the control range where the maximum RF output can be obtained.
* The control range is wide. (The RF output is almost constant within a certain range even when pressing the ▲ and ▼ tracking control keys.)
The control range is very narrow. (The RF output decreases immediately when pressing the ▲ and ▼ tracking control keys.)
Is the RF output maximum with the tracking control set at the center position?
Yes
No
Set the tracking control at the center position.
Turn the X-value adjusting driver for a maximum RF.
Continues to the next step "2. Checking false tracking".
Continued from the next step "2. Checking false tracking".
Is the RF output maximum with the tracking control set at the center position?
No
Yes
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
No
Set the tracking control at the center position.
Turn the X-value adjusting driver for a maximum RF.
Turn the X-value adjusting driver in clockwise direction, and set it at the position where the RF output is about to decrease.
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
No
Yes
Continues to the next step "2. Checking false tracking".
Continued from the next step "2. Checking false tracking".

Table. 4-1

2. Checking false tracking
(Using the tape having the version No.)


Connect an oscilloscope as follows:
CH1: Connector PB RF terminal for RF PC board check
CH2: Audio signal output terminal
CH3: Connector RF SWP terminal for RF PC board check
Set the oscilloscope as follows:
TIME/DIV: 10ms
Trigger source : CH3
Trigger slope : +
Play back alignment tape:
KRV-52NE (NTSC)/52PL (PAL)
Set the tracking control at the center position.
Adjust the SWEEP VARIABLE control on the oscilloscope so that no signal section of the 5 kHz audio signal (CH2) appears at a fixed position on the screen as shown in next page.
Is the phase relationship between no signal section of the PB RF signal (CH1) and signal (CH2) correct? (Refer to next page.)
Normal (Normal tracking)
Not normal and PB RF signal is advanced. (False tracking in clockwise direction)
Not normal and PB RF signal is delayed. (False tracking in counterclockwise direction)
Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +
Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +
Turn the X-value adjusting driver in clockwise direction for a maximum RF output.
Turn the X-value adjusting driver in counterclockwise direction for a maximum RF output.
Adjustment has been completed.
Continues to the previous step "1. Adjusting X-value".
Continues to the previous step "1. Adjusting X-value".

Note : In case of 2 phenomenons oscilloscope.
Set and connect as follows.
CH1 : PB RF terminal
CH2 : Audio signal output terminal
External trigger : RF SWP terminal Trigger slope : +

Table. 4-2

Using the tape having the version No.

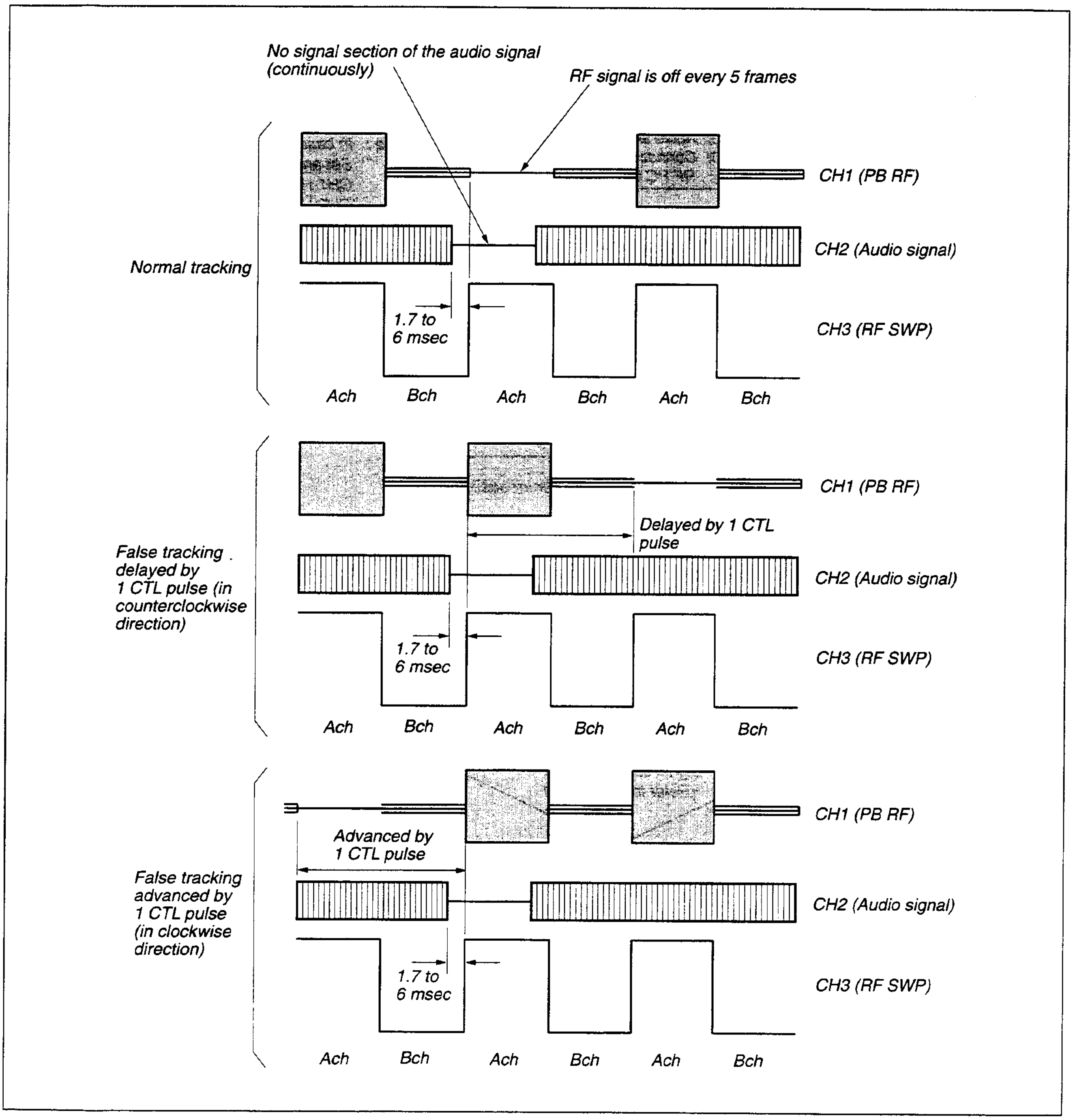

No signal section of the audio signal (continuously)
RF signal is off every 5 frames
Normal tracking
CH1 (PB RF)
CH2 (Audio signal)
CH3 (RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch
False tracking delayed by 1 CTL pulse (in counterclockwise direction)
Delayed by 1 CTL pulse
CH1 (PB RF)
CH2 (Audio signal)
CH3 (RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch
False tracking advanced by 1 CTL pulse (in clockwise direction)
Advanced by 1 CTL pulse
CH1 (PB RF)
CH2 (Audio signal)
CH3 (RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch

Table. 4-3

[Adjustment Method (*For the VCRs Equipped with Narrow Gap Video Heads)]

Set the tracking control at the center position. Set the ACE head position with X-value adjusting driver both where a maximum RF output is obtained and where the RF output decreases immediately when the ▲ tracking control key is pressed.

* TYPE OF DRUM
DZH-98A

1. Adjusting X-value
(Using the tape having the version No.)

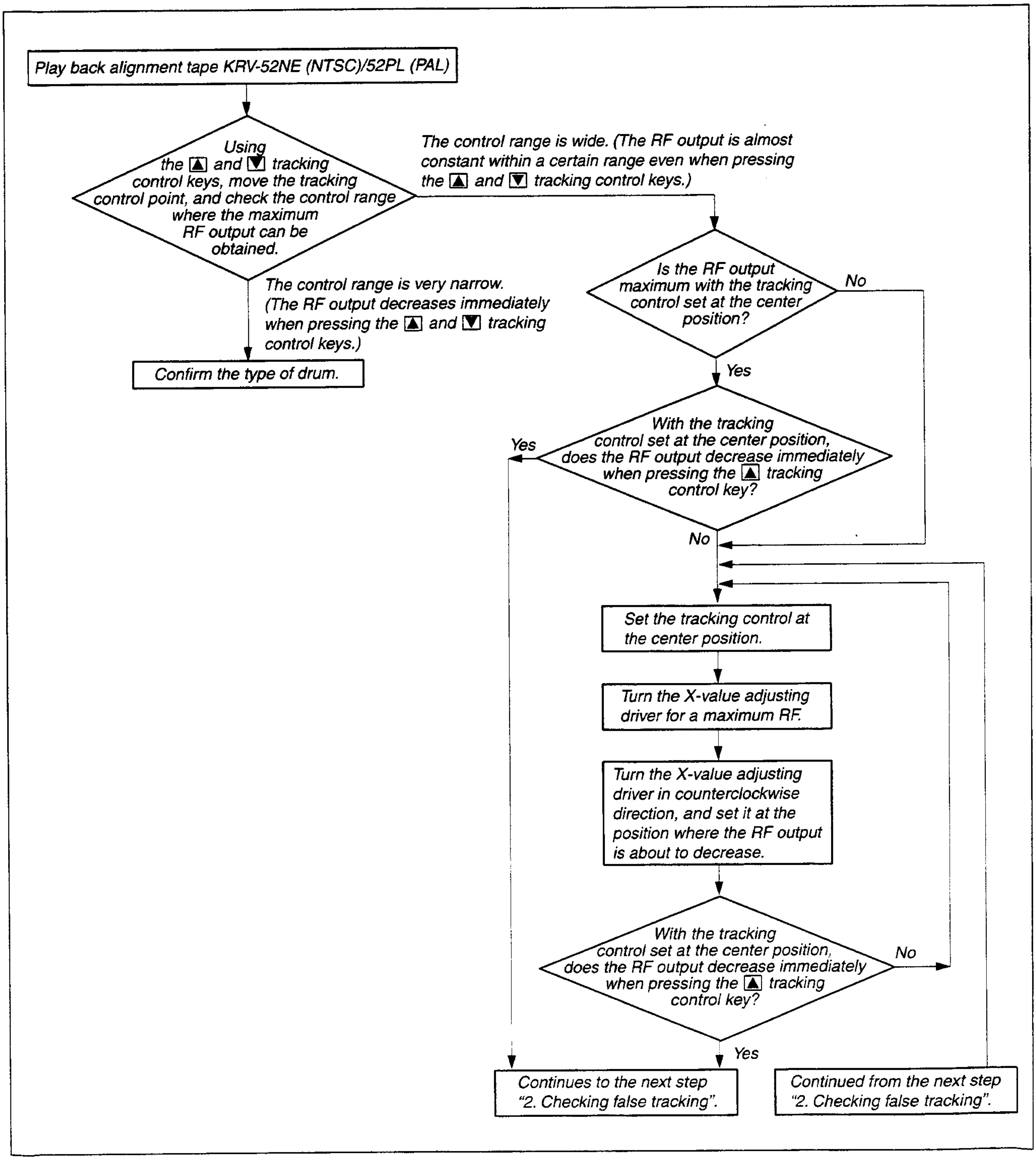
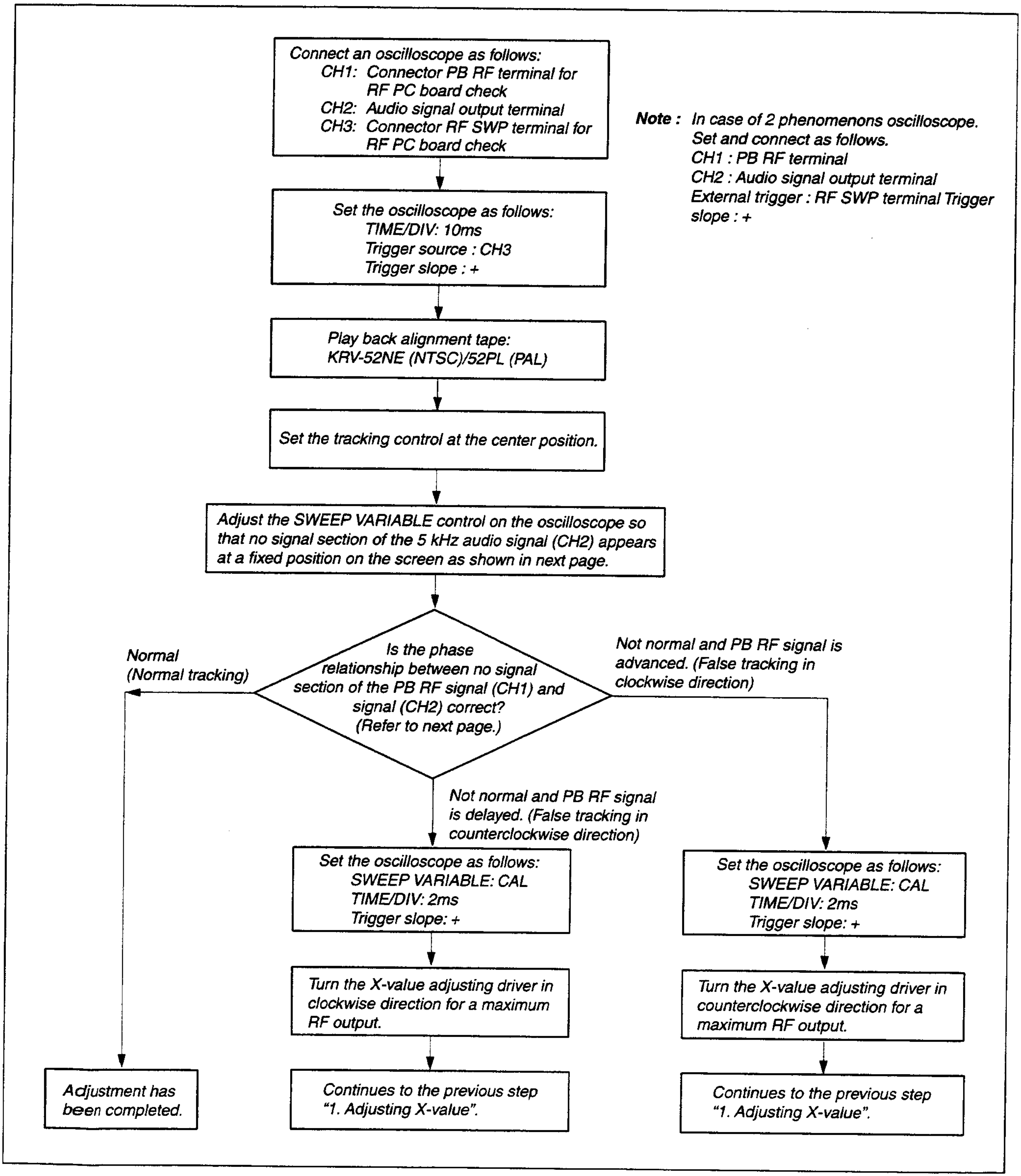

Play back alignment tape KRV-52NE (NTSC)/52PL (PAL)
Using the ▲ and ▼ tracking control keys, move the tracking control point, and check the control range where the maximum RF output can be obtained.
The control range is wide. (The RF output is almost constant within a certain range even when pressing the ▲ and ▼ tracking control keys.)
The control range is very narrow. (The RF output decreases immediately when pressing the ▲ and ▼ tracking control keys.)
Confirm the type of drum.
Is the RF output maximum with the tracking control set at the center position?
No
Yes
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▲ tracking control key?
Yes
No
Set the tracking control at the center position.
Turn the X-value adjusting driver for a maximum RF.
Turn the X-value adjusting driver in counterclockwise direction, and set it at the position where the RF output is about to decrease.
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▲ tracking control key?
No
Yes
Continues to the next step "2. Checking false tracking".
Continued from the next step "2. Checking false tracking".

Table. 4-4

2. Checking false tracking
(Using the tape having the version No.)



Connect an oscilloscope as follows:
CH1: Connector PB RF terminal for RF PC board check
CH2: Audio signal output terminal
CH3: Connector RF SWP terminal for RF PC board check

Set the oscilloscope as follows:
TIME/DIV: 10ms
Trigger source : CH3
Trigger slope : +

Play back alignment tape:
KRV-52NE (NTSC)/52PL (PAL)

Set the tracking control at the center position.

Adjust the SWEEP VARIABLE control on the oscilloscope so that no signal section of the 5 kHz audio signal (CH2) appears at a fixed position on the screen as shown in next page.

Is the phase relationship between no signal section of the PB RF signal (CH1) and signal (CH2) correct? (Refer to next page.)

Normal (Normal tracking)

Adjustment has been completed.

Not normal and PB RF signal is delayed. (False tracking in counterclockwise direction)

Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +

Turn the X-value adjusting driver in clockwise direction for a maximum RF output.

Continues to the previous step "1. Adjusting X-value".

Not normal and PB RF signal is advanced. (False tracking in clockwise direction)

Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +

Turn the X-value adjusting driver in counterclockwise direction for a maximum RF output.

Continues to the previous step "1. Adjusting X-value".

Note : *In case of 2 phenomenons oscilloscope. Set and connect as follows.*
CH1 : PB RF terminal
CH2 : Audio signal output terminal
External trigger : RF SWP terminal Trigger slope : +

Table. 4-5

Using the tape having the version No.

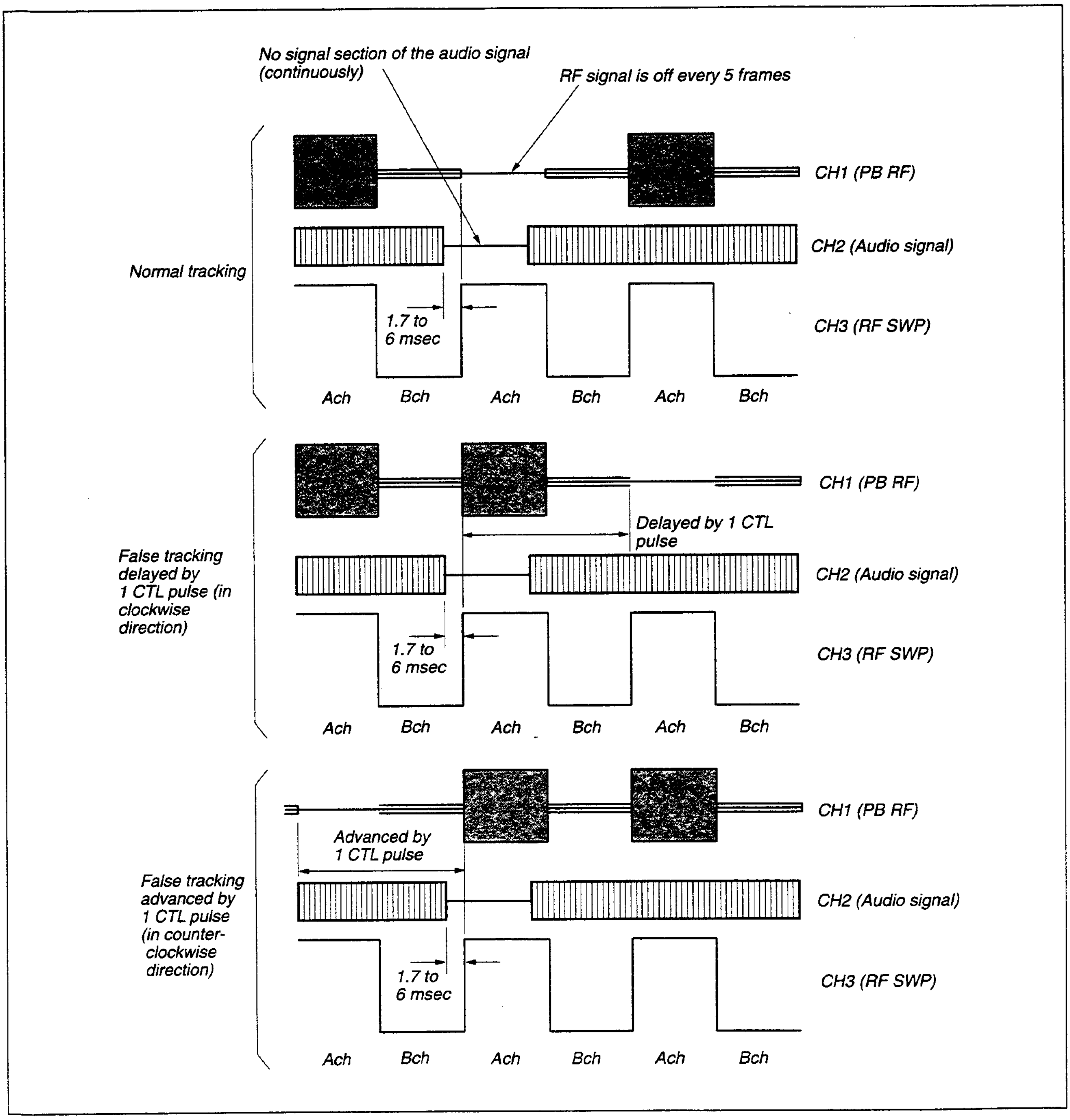

No signal section of the audio signal (continuously)
RF signal is off every 5 frames
Normal tracking
CH1 (PB RF)
CH2 (Audio signal)
CH3 (RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch
False tracking delayed by 1 CTL pulse (in clockwise direction)
Delayed by 1 CTL pulse
CH1 (PB RF)
CH2 (Audio signal)
CH3 (RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch
False tracking advanced by 1 CTL pulse (in counter-clockwise direction)
Advanced by 1 CTL pulse
CH1 (PB RF)
CH2 (Audio signal)
CH3 (RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch

Table. 4-6

Reference

• X-VALUE ADJUSTMENT
(Using KRV-52NE having no version No.)

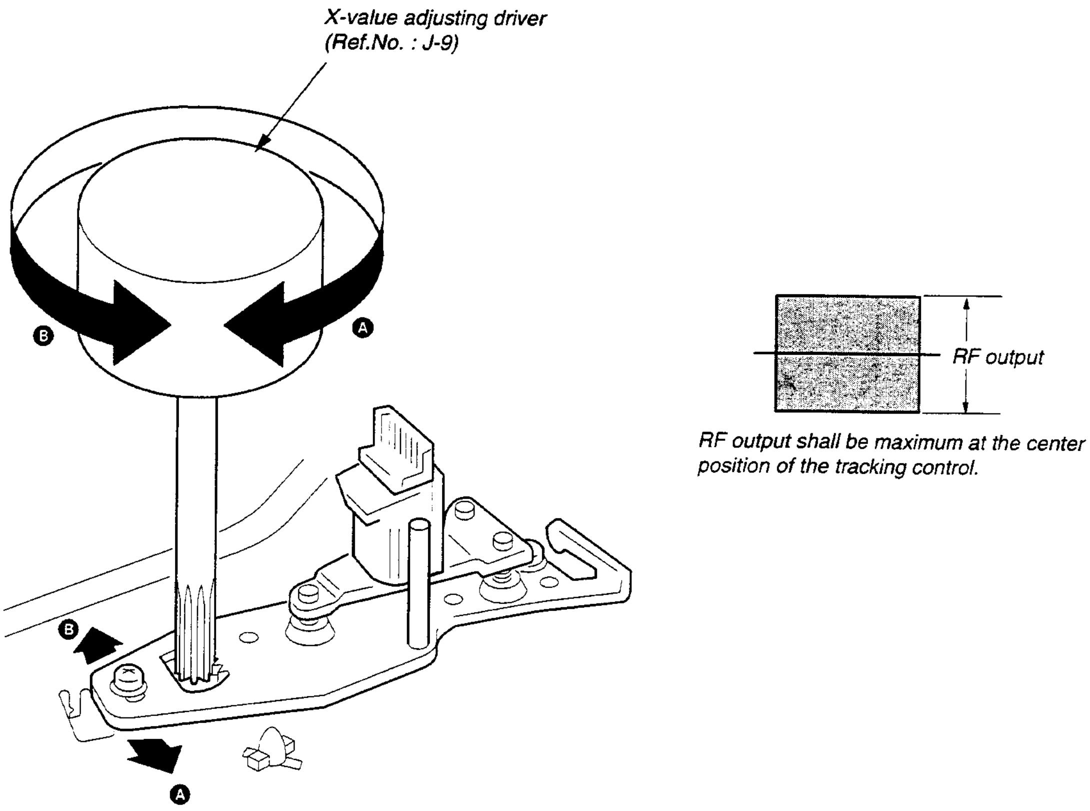
Purpose : To obtain compatibility with other VCRs.

Precaution : Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys. Press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

Mode	Playback
Signal	Alignment tape: KRV-52NE (For NTSC having no version No.)
Measuring instrument	Oscilloscope TIME/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH1: Connector PB RF pin for RF PC board check CH2 : Connector RF SWP pin for RF PC board check
Adjustment locations	ACE base assembly

[Adjustment Method]

Set the tracking control at the center position. For the VCRs equipped with standard gap video heads, set the X-value adjustment screw where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the X-value adjustment screw both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.



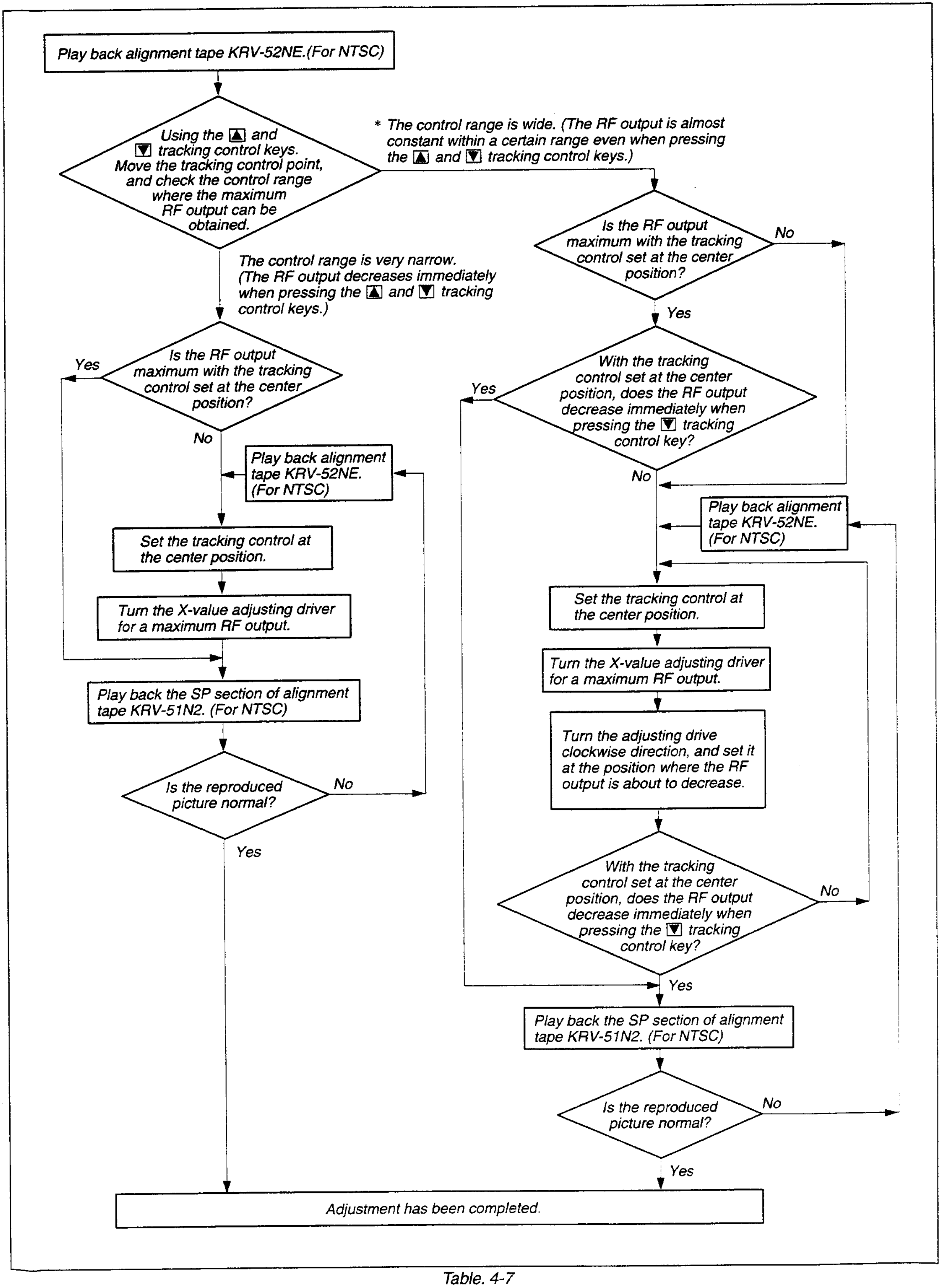
RF output shall be maximum at the center position of the tracking control.

Fig. 4-3

X-VALUE ADJUSTMENT
(Using the tape having no version No.)

* TYPE OF DRUM

DZH-68D
DZH-71D
DZH-77A
DZH-78A
DZH-78B
DZH-89A
DZH-90A
DZH-91A
DZH-92A



Play back alignment tape KRV-52NE.(For NTSC)
Using the ▲ and ▼ tracking control keys. Move the tracking control point, and check the control range where the maximum RF output can be obtained.
* The control range is wide. (The RF output is almost constant within a certain range even when pressing the ▲ and ▼ tracking control keys.)
The control range is very narrow. (The RF output decreases immediately when pressing the ▲ and ▼ tracking control keys.)
Is the RF output maximum with the tracking control set at the center position?
Yes
No
Play back alignment tape KRV-52NE. (For NTSC)
Set the tracking control at the center position.
Turn the X-value adjusting driver for a maximum RF output.
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Is the reproduced picture normal?
No
Yes
Is the RF output maximum with the tracking control set at the center position?
No
Yes
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
No
Play back alignment tape KRV-52NE. (For NTSC)
Set the tracking control at the center position.
Turn the X-value adjusting driver for a maximum RF output.
Turn the adjusting drive clockwise direction, and set it at the position where the RF output is about to decrease.
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
No
Yes
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Is the reproduced picture normal?
No
Yes
Adjustment has been completed.

Table. 4-7

[Adjustment Method (*For the VCRs Equipped with Narrow Gap Video Heads)]

Set the tracking control at the center position. Set the ACE head position with X-value adjusting driver both where a maximum RF output is obtained and where the RF output decreases immediately when the ▲ tracking control key is pressed.

* TYPE OF DRUM
DZH-98A

Using the tape having the version No.

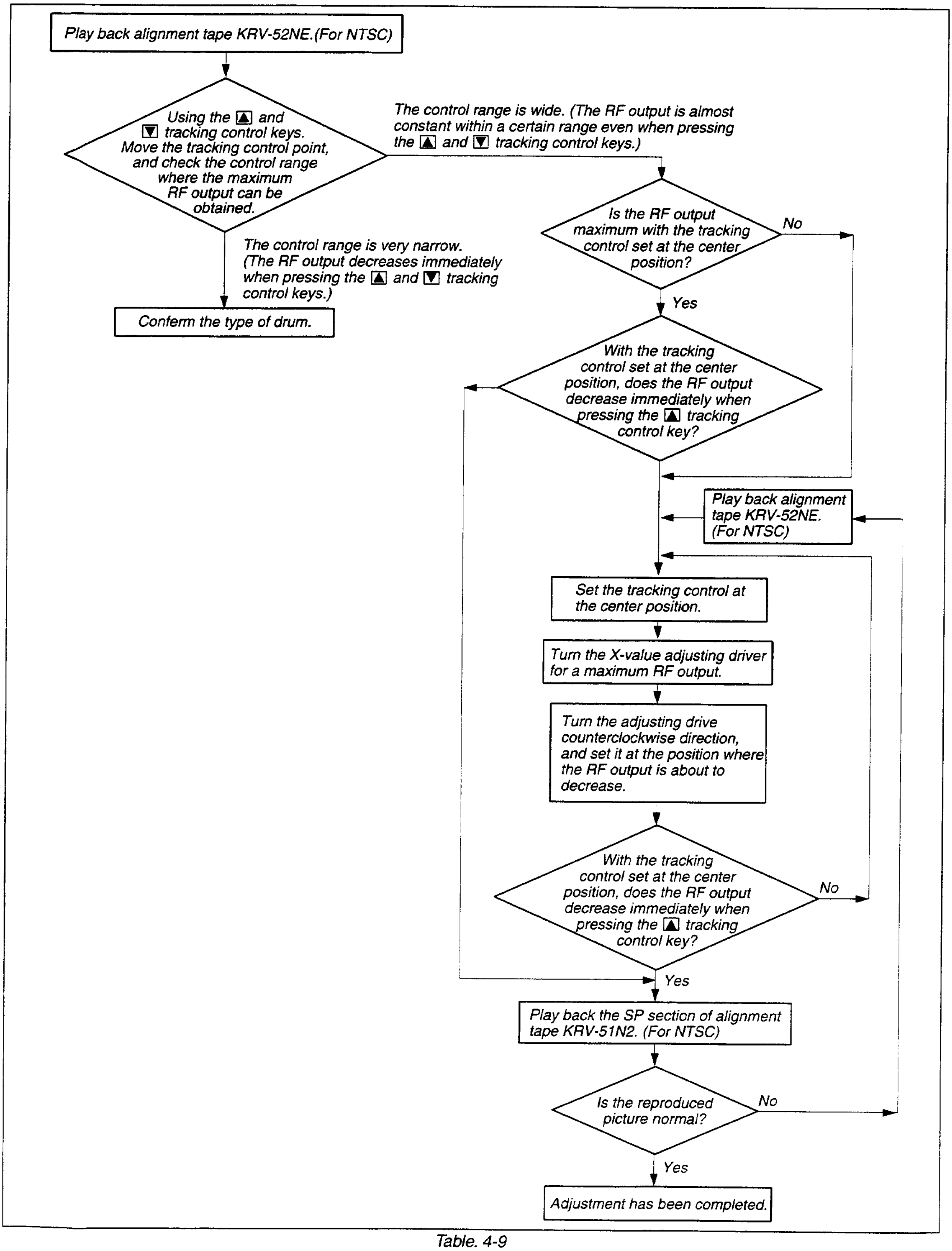

Play back alignment tape KRV-52NE.(For NTSC)
Using the ▲ and ▼ tracking control keys. Move the tracking control point, and check the control range where the maximum RF output can be obtained.
The control range is wide. (The RF output is almost constant within a certain range even when pressing the ▲ and ▼ tracking control keys.)
The control range is very narrow. (The RF output decreases immediately when pressing the ▲ and ▼ tracking control keys.)
Conferm the type of drum.
Is the RF output maximum with the tracking control set at the center position?
No
Yes
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▲ tracking control key?
Play back alignment tape KRV-52NE. (For NTSC)
Set the tracking control at the center position.
Turn the X-value adjusting driver for a maximum RF output.
Turn the adjusting drive counterclockwise direction, and set it at the position where the RF output is about to decrease.
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▲ tracking control key?
No
Yes
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Is the reproduced picture normal?
No
Yes
Adjustment has been completed.

Table. 4-9

4-1-4. HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6

Mode	Playback
Signal	Alignment tape: KRV-52NE (NTSC)/52PL (PAL)
Measuring instrument	Oscilloscope TIME/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH1: Connector PB RF pin for RF PC board check CH2: Connector RF SWP pin for RF PC board check
Adjustment locations	Height adjustment screw for No. 3 tape guide roller Height adjustment screw for No. 6 tape guide roller

[Adjustment Method]

The following adjustment shall be carried out after completed Section 4-1-2. X-VALUE ADJUSTMENT.

1) Deactivate the automatic tracking control, and set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).
2) Check if the RF output changes in amplitude by pressing the tracking control key. The RF output should change periodically (changes from a minimum amplitude to a maximum amplitude, and to the minimum amplitude again).

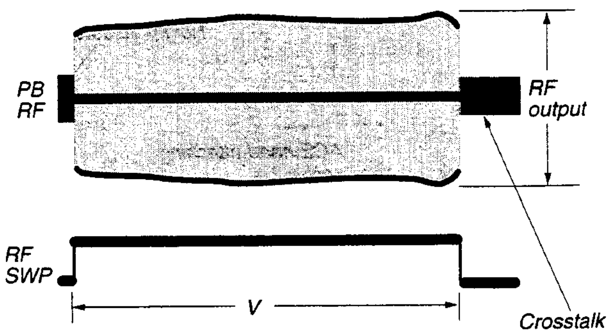
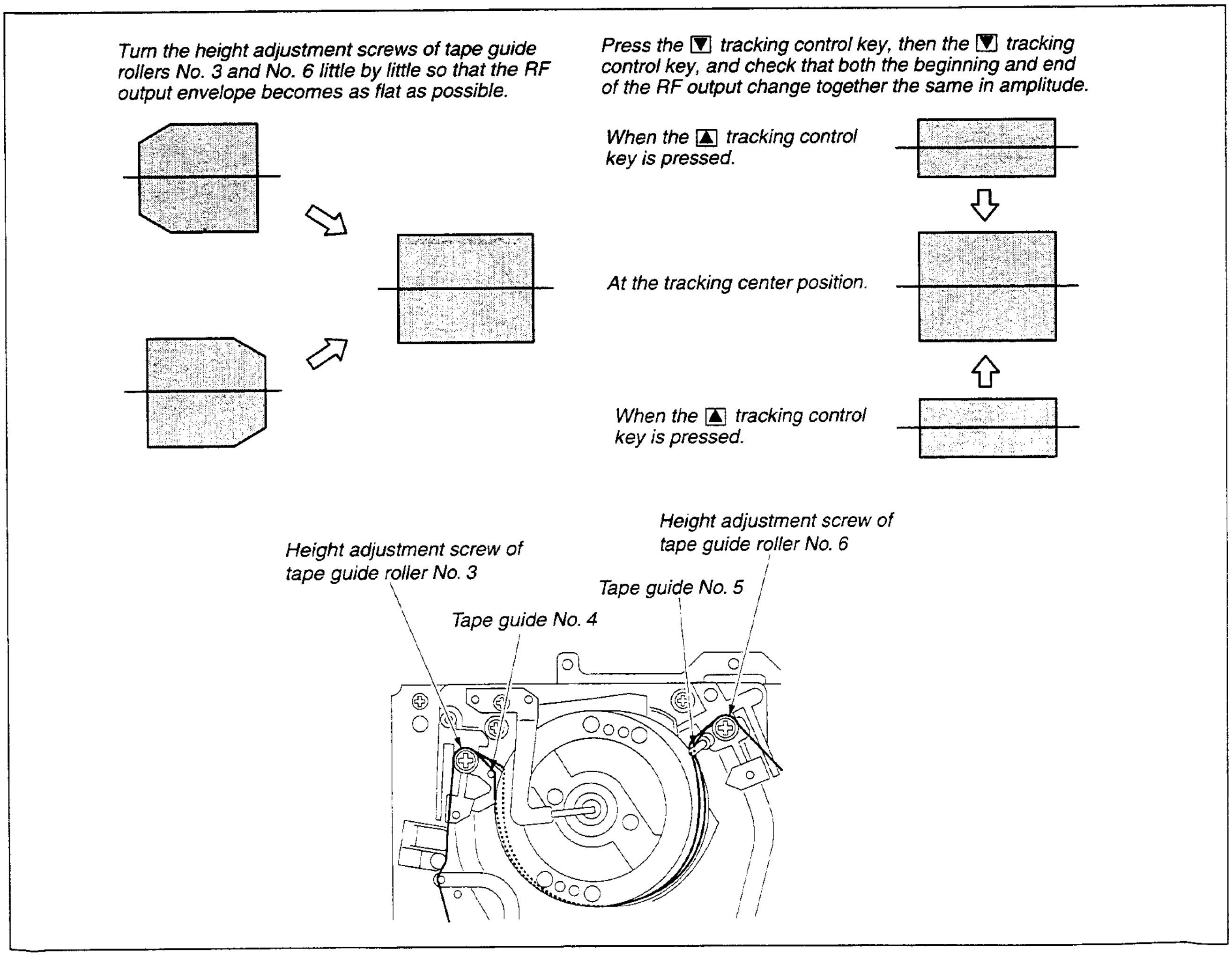

PB RF
RF output
RF SWP
V
Crosstalk

Fig. 4-4

3) Turn the height adjustment screws of tape guide rollers No. 3 and No. 6 so that the RF output envelope becomes as flat as possible.
4) Press the ▲ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.
5) Press the ▼ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.



Turn the height adjustment screws of tape guide rollers No. 3 and No. 6 little by little so that the RF output envelope becomes as flat as possible.

Press the ▼ tracking control key, then the ▼ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.

When the ▲ tracking control key is pressed.
At the tracking center position.
When the ▲ tracking control key is pressed.
Height adjustment screw of tape guide roller No. 6
Height adjustment screw of tape guide roller No. 3
Tape guide No. 5
Tape guide No. 4

Fig. 4-5

4-1-5. ACE HEAD ASSEMBLY HEIGHT AND AZIMUTH ADJUSTMENT

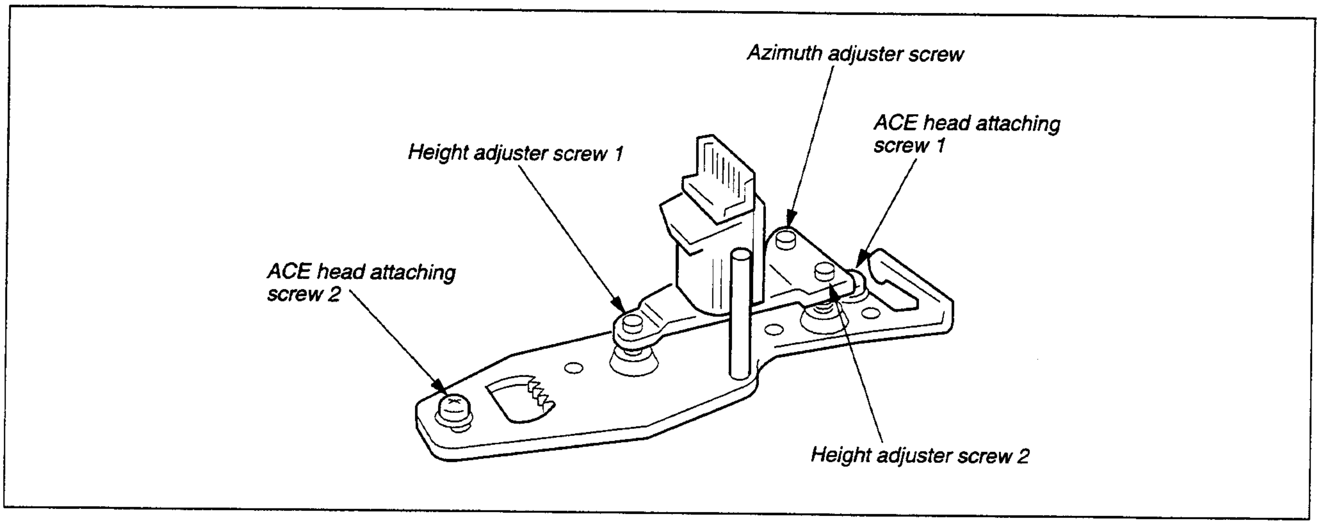

Azimuth adjuster screw
ACE head attaching screw 1
Height adjuster screw 1
ACE head attaching screw 2
Height adjuster screw 2

Fig. 4-6

Mode	Playback
Signal	Alignment tape: (5kHz) KRV-52NE (NTSC)/52PL (PAL)
Measuring instrument	Oscilloscope
Measuring point	Audio output terminal
Adjustment locations	Azimuth adjuster screw, Height adjuster screws 1 and 2.

[Adjustment Method]

1) Adjust the height as shown in the figure with turning the height adjuster screws 1 and 2, and the azimuth adjuster screw in the same direction, the same degree gradually.

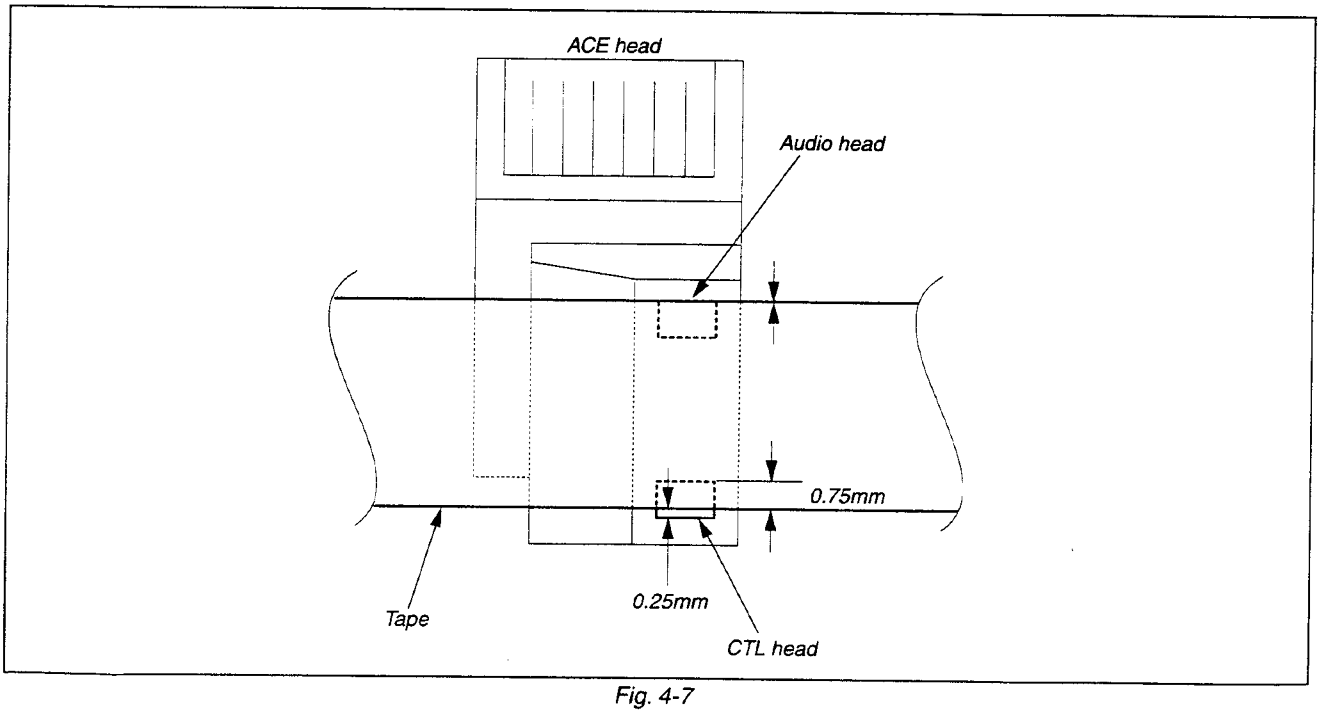

ACE head
Audio head
0.75mm
Tape
0.25mm
CTL head

Fig. 4-7

2) Alternately adjust the azimuth adjuster screw to make A maximum and B minimum. (To maintain even audio output at maximum with minimum deviation.)
3) Perform section 4-1-2. X-VALUE ADJUSTMENT.
4) Tighten ACE head attaching screw 2. (Torque: More than 0.29 N•m (3.0 kg•cm)).

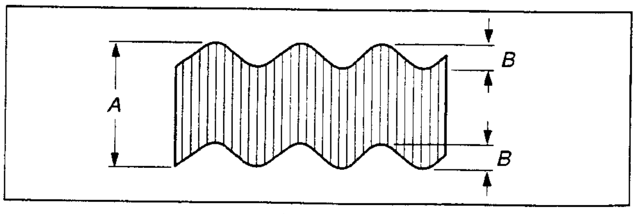


Fig. 4-8

4-1-6. X-VALUE FINE ADJUSTMENT

The procedure is the same as the item 4-1-3. Please refer to pages 37 to 46.

4-1-7. HEIGHT ADJUSTMENT OF GUIDE ROLLER NO. 8

Note : Applicable to the set having TG8 height adjusting screw as shown in the figure. Do not adjust when TG8 height adjusting screw is not attached.

Mode	Playback
Signal	Any signal on thin tape (T-160 or the like) near the tape top.
Adjustment location	TG8 height adjusting screw

[Adjustment Method]

1) Confirm there is no wrinkles of tape between TG8 and capstan and no tape curl at the upper or the lower flanges of TG8 during 10 seconds CUE running.
2) When there is curls or wrinkles, adjust with TG8 height adjusting screw.
3) Confirm there is no wrinkles of tape between TG8 and capstan and no tape curl at the upper or the lower flanges of TG8 during 8 seconds REV running.
4) When there is curls or wrinkles, adjust with TG8 height adjusting screw.

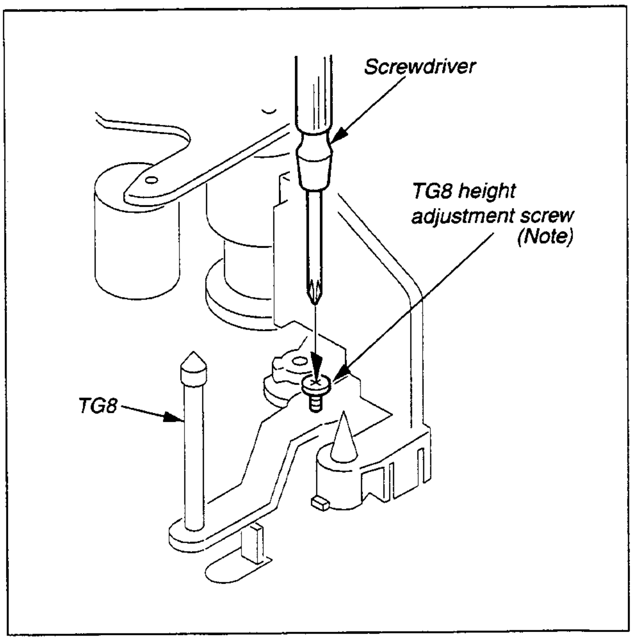


Fig. 4-9

4-1-8. CHECKING THE LINEARITY AND FLUCTUATION OF THE RF OUTPUT

1) Set the RF output to the maximum level using the tracking buttons.

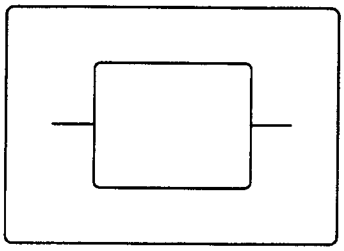


Fig. 4-10-1

2) Perform fine adjustment of the voltage level range of the oscilloscope, adjust the RF output deviation to within 6 gradations.

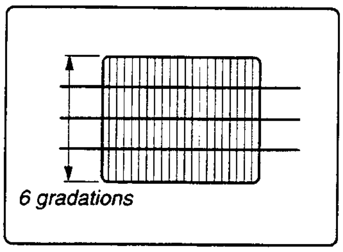


Fig. 4-10-2

3) Press the tracking buttons and adjust the maximum amplitude of the RF output to within 4 gradations.
4) At this time, check if the minimum amplitude is more than 2 gradations.

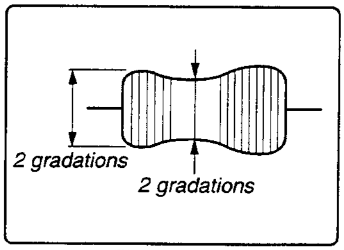


Fig. 4-10-3

5) Check that RF output fluctuation between minimum and maximum levels is within 13%.

5. EXPLODED VIEWS

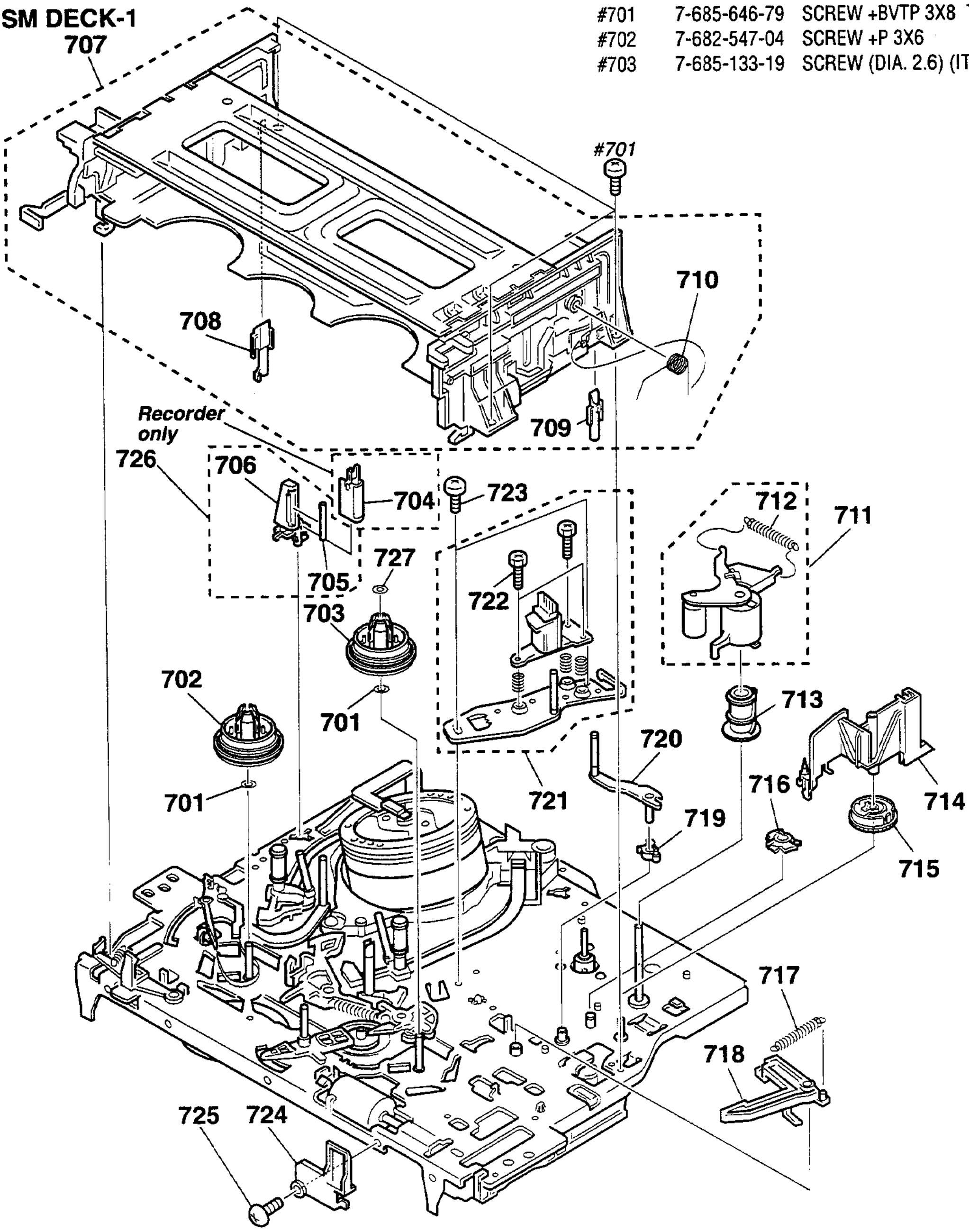
Note:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

****
HARDWARE LIST
****

#701	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3
#702	7-682-547-04	SCREW +P 3X6
#703	7-685-133-19	SCREW (DIA. 2.6) (IT3B)

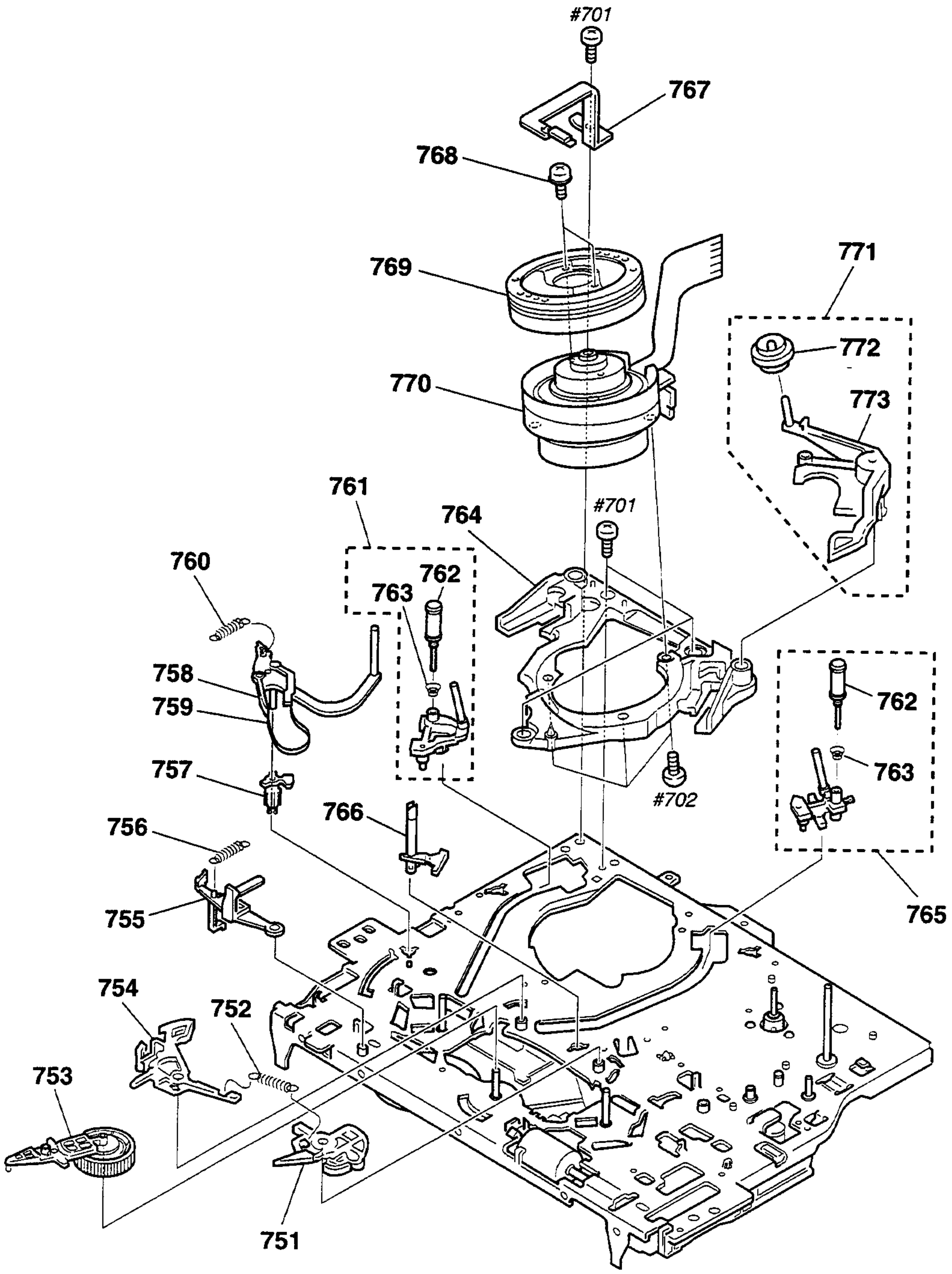
5-1. MECHANISM DECK-1



Ref. No.	Part No.	Description	Remarks
701	3-977-509-01	WASHER, THRUST	
702	3-977-507-01	TABLE, REEL (S) (GRAY)	
703	3-977-508-01	TABLE, REEL (T) (BLACK)	
704	1-500-144-11	HEAD, FE (RECORDER)	
705	3-977-495-01	SHAFT TG2 (RECORDER)	
706	3-977-494-01	HOLDER, FEH (RECORDER)	
707	A-6759-619-A	FL COMPLETE ASSY BOARD, COMPLETE	
708	3-977-535-01	PLATE, LUMINOUS(END SENSOR)	
709	3-977-536-01	PLATE, LUMINOUS(TOP SENSOR)	
710	3-970-471-01	SPRING (DECK OPEN), TORSION	
711	A-6759-615-A	PRESS BLOCK ASSY, PINCH	
712	3-958-455-01	SPRING (PINCH), TENSION	
713	3-977-447-01	GEAR, ELEVATOR	
714	3-977-514-01	OPENER, LID	

Ref. No.	Part No.	Description	Remarks
715	3-977-441-01	GEAR, PINCH PRESSING	
716	3-977-445-01	GEAR, TG8 ARM DRIVING	
717	3-977-465-01	SPRING,EXTENSION(RVS BRAKE)	
718	X-3947-582-1	ARM ASSY, RVS BRAKE	
719	3-977-446-01	GEAR, TG8 ARM	
720	X-3947-590-1	TG8 ASSY	
721	A-6759-620-A	HEAD BLOCK ASSY, ACE (TDK)	
722	3-974-556-01	+ HEXA TT 2.6X9 (TAPER)	
723	3-979-508-01	SCREW	
724	3-978-485-01	PLATE, GUIDE CASSETTE	
725	3-696-519-01	+P IT3 SCREW 3X8	
726	X-3947-817-1	FEH, ASSY (PLAYER)	
727	3-977-443-01	WASHER, STOPPER	

5-2. MECHANISM DECK-2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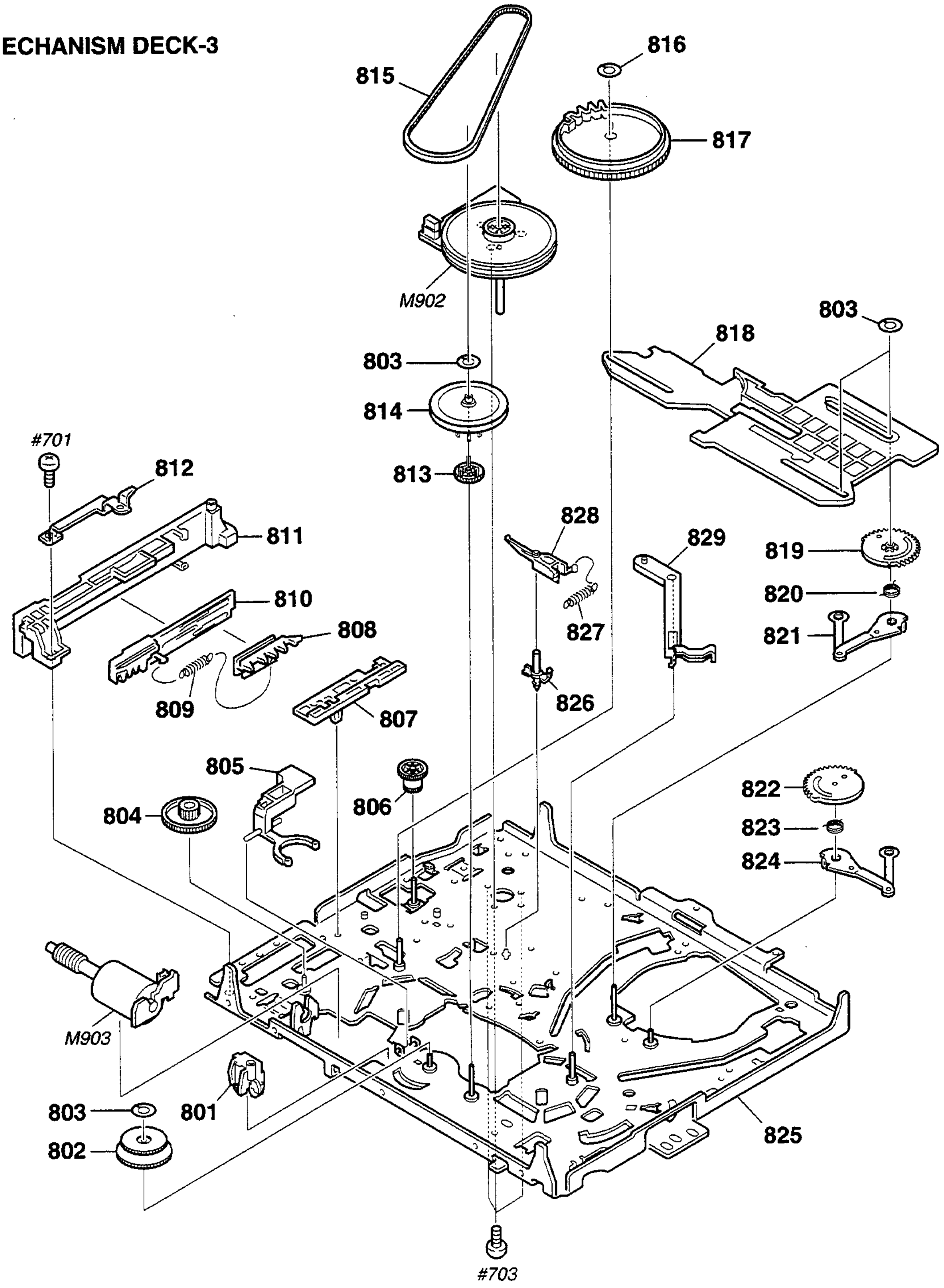
Ref. No.	Part No.	Description	Remarks
751	X-3947-581-1	BRAKE ASSY,MAIN(T)	
752	3-977-462-01	SPRING,EXTENTION. (MAIN BRAKE)	
753	X-3947-573-1	ARM ASSY, PENDULUM	
754	X-3947-580-1	BRAKE ASSY, MAIN(S)	
755	3-977-513-01	LEVER, REC. PROOF	
756	3-976-767-01	SPRING, TENS. (REC. PROOF)	
757	3-977-487-01	BOSS, TG1 FULCRUM	
758	X-3947-587-1	TG1 ASSY	
759	X-3947-589-1	BAND ASSY, TG1	
760	3-977-488-01	SPRING (POWER TENSION)	
761	A-6750-324-A	SHUTTLE (S) BLOCK ASSY	
762	X-3944-378-1	ROLLER ASSY, GUIDE	
763	3-965-178-01	SPRING	
764	3-969-629-01	BASE, DRUM	
765	A-6750-325-A	SHUTTLE (T) BLOCK ASSY	
766	3-977-501-01	PLATE, LUMINOUS	
767	X-3943-899-8	GROUND ASSY, SHAFT	
768	2-643-205-01	SCREW	
769		Refer to the service manual for each model.	
770		Refer to the service manual for each model.	
771	A-6759-614-A	ROLLER BLOCK ASSY, HC	
772	X-3947-255-1	ROLLER ASSY, HC	
773	3-977-537-01	ARM, HC ROLLER	

5-3. MECHANISM DECK-3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Ref. No.	Part No.	Description	Remarks
* 801	3-977-437-01	RETAINER,CAM MOTOR	
802	X-3947-584-1	ASSY, REEL DIRECT	
803	3-977-443-01	WASHER, STOPPER	
804	3-977-438-01	WORM - WHEEL	
805	3-977-506-01	ARM, LIMITTER SELECTION	
806	3-977-444-01	GEAR, PINCH TRANSMISSION	
807	3-977-515-01	GUIDE, FL SLIDER	
808	3-977-517-01	PLATE, SLIDE, FL	
809	3-977-519-01	SPRING, TENS. (LIMIT, FL)	
810	3-977-518-01	PLATE. LIMITTER, FL	
811	3-977-516-01	HOLDER, FL SLIDER	
812	3-977-877-01	PLATE, RETAINER	
813	3-977-504-01	GEAR, CLUTCH	
814	X-3947-585-1	GEAR ASSY, PULLEY	
815	3-977-510-01	BELT, RUBBER	
816	3-977-440-01	WASHER, STOPPER	
817	3-977-439-01	GEAR, CAM	
818	3-977-442-01	SLIDER	
819	3-977-455-01	GEAR, LOADING(T)	
820	3-977-456-01	SPRING, TORSION (LOAD T)	
821	X-3947-579-1	LEVER ASSY, LOADING(T)	
822	3-977-451-01	GEAR, LOADING(S)	
823	3-977-452-01	SPRING, TORSION (LOAD S)	
824	X-3947-578-1	LEVER ASSY, LOADING(S)	
825	X-3947-576-1	CHASSIS ASSY, MECHANICAL	
826	3-977-468-01	SHAFT, CAPSTAN BRAKE	
827	3-977-467-01	SPRING, CAP BRAKE	
828	X-3947-583-1	BRAKE ASSY, CAPSTAN	
829	3-977-489-01	ARM, TG1 DRIVING	
M902	1-698-971-11	MOTOR, DC	
M903	X-3947-577-1	MOTOR ASSY, CAM	

9-921-647-13
(Including 9-921-647-11, -12(81))

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Home A&V Products Company

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